University of Alberta

Individual Differences in Personal and Situational Factors Related to Motivation and Achievement Behaviour in Physically Awkward Children

by

Janice Causgrove Dunn ©

A thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

Faculty of Physical Education and Recreation

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Janice Causgrove Dunn

907-2345 Broad Street, Regina, Saskatchewan

May 13, 1997

University of Alberta

Faculty of Graduate Studies and Research

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled Individual Differences in Personal and Situational Factors Related to Motivation and Achievement Behaviour in Physically Awkward Children submitted by Janice Causgrove Dunn in partial fulfillment of the requirements for the degree Doctor of Philosophy.

Dr. E. Jane Watkinson

Dr. Marcel Bouffard

Dr. Graham Fishburne

Dr. Thomas O. Maguire

Dr. Linda P. Thompson

Dr. Joan Duda, Purdue University

May 8, 1997

Abstract

The focus of this dissertation was to investigate some of the assumptions of the syndrome of physical awkwardness (Wall, 1982; Wall, Reid, & Paton, 1990) by examining the motivational and behavioural correlates of movement incompetence. Study 1 explored the relationship between perceived physical competence and physical awkwardness in 195 children in Grades 3 through 6. The results indicated a significant effect for the interaction between severity of awkwardness and grade on perceived competence, but interpretation of the interaction revealed that the hypothesized negative association between perceived competence and severity of awkwardness was present only in third-grade children. For children in Grades 5 and 6, the opposite relationship was found. In Study 2, an achievement goal approach (Nicholls, 1989) was adopted to further investigate awkward children's perceptions of competence in physical education. Sixty-five physically awkward children in Grades 4 to 6 completed questionnaires assessing their (1) goal orientations, (2) perceptions of the motivational climates, and (3) perceived competence. Structural equation modeling (LISREL) revealed that the hypothesized model, based on achievement goal theory, was largely supported. Specifically, perceived competence was positively related to perceptions of a mastery climate and negatively related to perceptions of a performance climate. Ego orientation had positive direct effects on perceived competence and perceived performance climate, while task orientation had a positive direct effect on perceived mastery climate. However, the total effect of task orientation on perceived competence was more positive than that of ego orientation. In Study 3, the relationships between the motivational variables from the previous study and awkward children's physical education participation behaviours were examined. Participants included those from Study 2 plus 65 movement competent peers matched for age, sex, and classroom.

Results indicated that, in general, perceived competence was positively related to proportion of total class time awkward children spent engaged in adaptive behaviours, and negatively associated with the proportion of class time they spent engaged in maladaptive behaviours. Moreover, significant interactions revealed that these effects were differentially associated with perceptions of a performance climate. Implications for teachers, coaches, and parents are discussed, and future research directions in this area are suggested.

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CHAPTER 1

Introduction

The general focus of this dissertation is to examine the effects of movement incompetence upon the perceptions and behaviours of children who are physically awkward, in a physical activity setting. Labels such as physically awkward and clumsy are used to describe individuals who exhibit difficulty learning and performing culturally-normative movement skills, but who do not show signs of overt neurological, general sensory, or intellectual impairments (Hulme & Lord, 1986; Wall, 1982). Recently, a more clinical term, developmental coordination disorder (DCD), has been adopted by some researchers in favor of these other more descriptive labels. Culturally-normative skills refer to those skills commonly performed by the majority of individuals in a particular culture (Wall, Reid, & Paton, 1990). In North America, culturally normative movement skills include ball skills (e.g., catching, throwing, kicking and striking), running, swimming, skating, and skipping (Wall, 1982), although the extent to which some of these are culturally normative may vary with age and gender (Causgrove Dunn & Watkinson, 1996).

Estimates of the incidence of physical awkwardness range from approximately 5% to 15% of school-age children (Wall et al., 1990). This relatively wide range of estimates is due in part to the heterogeneous nature of the population, evident in the findings of a study by Hoare (1994) which distinguished five different subtypes of DCD within a sample of 80 children. The severity of awkwardness can vary from mild to severe and may be observed in a few specific skills or over a wide range of motor skills (Maeland, 1992; McMath, 1980). Moreover, although the specific etiology of physical awkwardness is unknown, suspected causes include emotional difficulties, delayed

development, experiential factors, an intrinsic motor impairment, or some combination of these factors (McMath, 1980; Smyth, 1992; Stott, Moyes, & Henderson, 1984).

A second factor contributing to the disparity across incidence estimates is the absence of a well-accepted identification procedure. For example, Maeland (1992) examined the results of three different methods used to identify awkward children: teachers' judgement (assisted by a checklist based on items in motor performance tests), the Test of Motor Impairment (TOMI, Stott et al., 1984), and the Test of Motor Proficiency (Gubbay, 1975). A low level of agreement was found between the three identification procedures, suggesting that each procedure identified a different subgroup of awkward children. Even studies that utilize common identification procedures have obtained dissimilar estimates of the incidence of awkwardness due to inconsistencies in the classification criteria used to distinguish children with and without movement difficulties. For example, published studies utilizing the TOMI to identify awkwardness have used criterion scores ranging from 3.5 (Causgrove Dunn & Watkinson, 1994) to 6.0 (Maeland, 1992; Riggen, Ulrich, & Ozmun, 1990). Finally, although the definition of awkwardness excludes those individuals with general intellectual, sensory, or neuromuscular impairments, many studies have either knowingly or unknowingly included individuals with these concurrent difficulties (Missiuna, 1994).

Numerous studies (e.g., Cantell, Smyth, & Ahonen, 1994; Henderson & Hall, 1982; Henderson, May, & Unmey, 1989; Schoemaker & Kalverboer, 1994; Smyth, 1992) have examined the characteristics of awkwardness as well as the social, emotional, and behavioural problems associated with motor incompetence. Based on the findings of these studies and predictions grounded in motivation theories (e.g., Harter, 1978, 1981), researchers have proposed a syndrome of physical awkwardness that is assumed to

result from movement incompetence (see Wall, 1982; Wall et al., 1990). Although a causal relationship has not yet been proven (due to the correlational and descriptive nature of these studies), a growing body of evidence supports the notion that a lack of physical or athletic ability has damaging consequences for children's social, affective, and motor development.

The impact of motor incompetence on children's development depends largely upon the value that the individual and his or her social milieu place on movement competence (Roberts & Treasure, 1992; Schoemaker & Kalverboer, 1994). In North America, motor or athletic competence is highly valued, and is considered particularly important for boys (Chase & Dummer, 1992; Duda, 1987; Evans & Roberts, 1987; Weiss & Duncan, 1992). In fact, Chase and Dummer (1992) found that boys rated "being a good athlete" as the most important criterion for male social status. Consequently, a lack of competence in play and sports skills can detrimentally affect the emotional, social, and motor skill development of children who are physically awkward (Kalverboer, de Vries, & van Dellen, 1990; Smyth, 1992).

Due to the "public" nature of motor performance, Wall (1982) suggests that children with movement difficulties become acutely aware of their inadequate motor skills and have difficulty hiding their poor performances from others. Lack of movement competence invites rejection and ridicule from peers, along with exclusion from play and game situations (Cratty, 1979; Portman, 1995; Roberts & Treasure, 1992). Not surprisingly, reports by parents, teachers, and children who are physically awkward frequently indicate that these children occupy only marginal positions in their peer groups and have few playmates (Clifford, 1985; Kalverboer et al., 1990, Cratty, 1979; Shoemaker & Kalverboer, 1994). In fact, a recent study by Dunn (1996) examined the

relationships between sociometric status, physical education class ability, youth sport experience, and perceived loneliness in children from grades 4 to 6. Results indicated that the average physical education class ability ratings that children received from classmates were significantly related to popularity status and feelings of loneliness; on average, children who were selected by peers as being "most-liked" received higher physical education class ability ratings than their least-liked classmates, while higher physical education class ability ratings from peers were associated with decreased perceptions of loneliness and greater social satisfaction in school. Dunn (1996) also found that team sport participation rates were related to feelings of loneliness such that the increased participation in organized team sports was associated with feelings of social satisfaction at school.

Research suggests that children with inadequate movement skills do not often participate in group games or team sports (Cantell et al., 1994; Wall, 1982; Wall et al., 1990), although interviews with boys who are physically awkward about their experiences on the playground have revealed that lack of participation is sometimes a matter of force rather than choice (i.e., they are prevented from joining in or are forced out of games by other participants) (Evans & Roberts, 1987). Even when children with movement difficulties actually get the opportunity to participate in group games and play, they are often relegated to minor roles providing few opportunities to interact with other children, and are frequently the target of criticism (Evans & Roberts, 1987; Portman, 1995; Shoemaker & Kalverboer, 1994). Indeed, observations of young children's activity patterns during physical education classes (Thompson, Bouffard, Watkinson, & Causgrove Dunn, 1994) and recess (Bouffard, Watkinson, Thompson, Causgrove Dunn, & Romanow, 1996) reveal that children with movement difficulties are, on average,

significantly less active than their motor competent peers. Additional evidence of inactivity is seen in low levels of physical fitness in physically awkward children (O'Beirne, Larkin, & Cable, 1994; Smyth, 1992; Wall et al., 1990).

Clearly, withdrawal from physical activity is not a constructive approach to coping with movement difficulties; withdrawal contributes to a practice deficit which increases existing performance differences between physically awkward children and their peers (Bouffard et al., 1996). As play becomes more complex and more demanding with age, the combination of increasingly poor motor performance, minimal enjoyment of physical activity, and socio-emotional difficulties creates a disinterest in (or dislike of) physical activity, making children who are physically awkward even less likely to be involved (Portman, 1995).

Several motivation theories predict the negative self-perceptions and withdrawal from physical activity assumed to result from inadequate movement skills (Bandura, 1977; Harter, 1978, 1981; Nicholls, 1989). As is discussed in Chapter 2, Harter's (1978, 1981) competence motivation theory asserts that individuals are motivated to demonstrate mastery. Repeated success in movement situations results in feelings of competence, the perception of an internal locus of control, and a desire to seek out similar opportunities in the future. In contrast, individuals who experience repeated failure in physical activity situations develop feelings of incompetence, perceive an external locus of control, and attempt to avoid similar activities in the future. By definition, children who are physically awkward experience repeated failures in movement situations and are therefore at risk of developing perceptions of incompetence, leading to avoidance of participation in future physical activity situations. However, as is revealed in Chapter 2, not all studies have found that children who are

physically awkward perceive themselves as incompetent in physical activity settings. Chapter 3, therefore, describes an investigation into why some of these children may perceive themselves as competent. A causal model based on Nicholls (1984, 1989) achievement goal theory, that assumes an interactionist framework (Endler & Magnusson, 1976) is proposed and tested. The results reveal that both the individual and the environment are important factors in determining the perceptions of competence of children who are physically awkward. Finally, Chapter 4 maintains the interactionist framework in an examination of the effect of perceptions of competence, perceptions of the motivational climate and goal orientations, on the behaviour of children who are physically awkward in structured physical activity settings.

In undertaking these studies, it was anticipated that the results would lead to a clearer understanding of the roles of the person and the environment in the development of the syndrome of physical awkwardness, and a clearer explanation as to why some children who are physically awkward do not develop the perceptual and behavioural patterns outlined in the syndrome. "Explanation is probably the ultimate goal of scientific inquiry, not only because it satisfies the need to understand phenomena, but also because it is the key for creating the requisite conditions for the achievement of specific objectives" (Pedhazur, 1982, p. 174.). Ultimately, it is hoped that information of this nature will enable adapted physical activity professionals, coaches, and educators to effectively target intervention strategies designed to prevent or remediate the negative self-perceptions and sedentary behaviour associated with the syndrome of physical awkwardness.

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CHAPTER 2

A Study of the Relationship Between Physical Awkwardness and Children's Perceptions of Physical Competence[1]

Children who are clumsy or awkward experience significant difficulty learning and performing motor skills, for no identifiable reason. They are identified by Hulme and Lord (1986) as those children who "have severe problems in developing adequate skills of movement in the absence of general sensory and intellectual impairments and without showing signs of overt neurological damage" (p. 257).

Based on motivation theories (e.g., Harter, 1978, 1981) and the findings of descriptive studies, researchers have proposed that a syndrome of physical awkwardness develops as a result of movement difficulties experienced by children who are physically awkward (Wall, 1982; Wall, Reid, & Paton, 1990). Wall (1982) and Wall et al. (1990) suggested that because lack of skill in the motor domain is very obvious, children who are clumsy have great difficulty hiding their poor motor performance from others in play and game situations. Lack of competence often invites ridicule from peers and exclusion from future group play situations. The social and motor difficulties experienced by children who are awkward may lead them to withdraw from participation in physical activity, especially group situations. Withdrawal contributes to lack of practice of the skills needed for successful participation, inhibits further motor development and increases existing performance differences between children with movement difficulties and their peers. Negative psychological consequences in the form of low levels of self esteem may also develop (Evans & Roberts, 1987; Shaw, Levine, & Belfer, 1982).

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[1]A version of this chapter has been published. Causgrove Dunn & Watkinson 1994. Adapted Physical Activity Quarterly. 11: 275-283.

Ultimately, inadequate motor performance, minimal enjoyment of physical activity, and related social difficulties may combine to create a disinterest in physical activity in addition to increasingly low levels of physical fitness (Wall et al., 1990).

The perception of ability is thought to have an important mediating effect on motivated behaviour. Harter's competence motivation theory (1978, 1981) suggests that the amount of success or failure an individual achieves in a particular domain will influence perceptions of competence. Individuals who have successful experiences develop positive perceptions of competence and internal control over performance, experience feelings of enjoyment and pleasure, and are motivated to participate in the future. Recurring failure, on the other hand, will produce perceptions of incompetence and external control, as well as negative affect (in the form of anxiety). These circumstances will undoubtedly impair the individual's motivation to participate in the future. Harter contends that individuals make distinctions in their perceptions of competence across different domains (e.g., academic, physical, social). She also proposes that domain-specific perceptions of competence are linked to global self-worth, and that self-evaluative perceptions become increasingly differentiated with age (Harter, 1985a).

If the boundaries of Harter's (1978, 1981) competence motivation theory are extended to include children who are physically awkward, the awkwardness syndrome described by Wall (1982) and Wall et al. (1990) suggests that these children will develop low perceptions of competence and will experience anxiety in physical activity situations. Moreover, due to the cumulative effects of failed mastery attempts and increasing accuracy of self-judgements (Harter, 1981, 1982; Nicholls, 1978, 1989; Wall, 1982; Weiss & Horn, 1990), the perceptions of physical competence of children who are

awkward should actually decrease as they get older.

In a study of the leisure time pursuits of 7 children who were physically awkward (aged 9 to 11 years), Clifford (1985) found a tendency for subjects to avoid culturally normative leisure-time pursuits such as team sports, community-sponsored activities, social organizations, and involvement in camps, as predicted by Wall (1982) and Wall et al. (1990). However, the most interesting results were the scores obtained on the physical subscale of the Perceived Competence Scale for Children (Harter, 1982). Contrary to what was expected, the scores of Clifford's subjects indicated high perceptions of competence. Although these results are surprising, there are a number of possible explanations.

First, Clifford's subjects were selected from a remedial physical activity program. Therefore, any comparisons the children made among themselves could have resulted in perceptions of competence relative to other participants. Second, the philosophy of the program in which the subjects were enroled was such that participants likely experienced an abundance of positive reinforcement and approval for attempting appropriate skills and activities. Consequently, the competence judgements of Clifford's subjects may have reflected the evaluative feedback these children received from instructors of the physical activity program. Harter (1978, 1981) has noted that reinforcement and approval of mastery attempts (rather than outcomes) contribute to perceptions of competence. Lastly, it is possible that the desire to be physically competent influenced the children's perceptions. Stipek (1984) found that children's desires influence judgements of their own competence and expectations of future success. Perhaps the strong desire to be competent in physical activities and sports influenced subjects' judgements of their own physical competence, irrespective of actual

ability.

The purpose of this study was to examine whether perceptions of physical competence decrease with increasing levels of awkwardness and grade. Based on Harter's theory of achievement motivation (1978, 1981) and the syndrome of physical awkwardness proposed by Wall (1982) and Wall et al. (1990), it was expected that perceptions of physical competence would decrease as motor incompetence increased. It was also expected that increased accuracy of older children's assessments of ability would lead subjects in higher grades to exhibit lower perceptions of physical competence than their younger counterparts (Nicholls, 1989). An interaction between severity of awkwardness and grade was predicted based on the increasingly greater performance differences between children with movement difficulties and their peers as they progress through school (Wall et al., 1990), as well as the increasingly detrimental effects of motor incompetence as children begin to conceive ability as current capacity (Nicholls, 1989). Substantial gender differences in perceptions of physical competence have been found in previous studies utilizing the athletic subscale of Harter's Self-Perception Profile for Children (1985b), and therefore were anticipated in the present study. In addition, the importance of physical competence was included based on Stipek's (1984) finding that children's desires influence judgements of their own competence and expectations of future success.

Method

Participants

The study included 195 children (97 males, 98 females) from Grades 3 through 6 (see Table 2-1). Fifty subjects were recruited with the help of parents or teachers, who had screened and categorized the children as potentially awkward or nonawkward. It

should be noted, however, that severity of awkwardness was determined through administration of a motor performance test. A second and ultimately more efficient recruitment strategy was later adopted, due to teachers' reluctance to identify (i.e., label) children as potentially physically awkward. Rather than asking teachers to identify potentially awkward children, a motor performance test was administered to entire classrooms of children. The remaining 145 subjects, therefore, were obtained through this second recruitment procedure.

Table 2-1

Means and Standard Deviations of Subjects' Ages

	Female			Male		
Grade	n	M	SD	n	M	SD
3	36	8.31	.52	39	8.28	.96
4	20	9.60	.50	15	9.33	.62
5	23	10.35	.49	17	10.18	.73
6	19	11.37	.50	26	11.38	.57

Measures

Severity of Awkwardness. Severity of awkwardness was measured using the Test of Motor Impairment - Henderson Revision (TOMI) (Stott, Moyes, & Henderson, 1984). The TOMI has been recommended for the identification of physically awkward children (e.g., Stott et al., 1984; Wall et al., 1990) and is comprised of four age bands that span the elementary school years (i.e., 5 to 12 years old). Each age band includes eight items measuring static and dynamic balance, manual dexterity, and ball skills. Scores on the individual items are summed to produce a total score ranging from 0 to

16, with higher scores indicating increasing levels of motor impairment. Scores are interpreted as follows: 0 - 1.5 indicates at least average competence, 2.0 - 3.5 may indicate a minor motor problem, 4.0 - 5.5 indicates a moderate motor problem, and 6.0 or greater represents a definite motor problem. Validity of the TOMI is reported in the test manual with reference to empirical studies demonstrating agreement between children's performances on the test and assessments by teachers (e. g., Henderson & Hall, 1982; Lam, 1982, as cited in Stott et al., 1984). Further support of the construct validity of the TOMI was established by Riggen, Ulrich and Ozman (1990), who reported 88% agreement between the TOMI and the Bruininks-Oseretsky Test of Motor Proficiency-Short Form in identifying children with a definite motor difficulty. Test-retest reliability is reported in the test manual as .70 with the same tester and .75 with different testers. Riggen et al. (1990) measured test-retest reliability in terms of decision consistency (motor impairment as indicated by a score of 6 or greater, versus nonimpairment), and reported a Kappa coefficient of .71.

Perceived Physical Competence. The athletic subscale of the Self-Perception Profile for Children (Harter, 1985b) was administered to all subjects. Responses to items are scored on a 4-point scale where a score of 1 indicates low perceived competence and a score of 4 reflects high perceived competence. The subscale contains six items. Factorial validity of this subscale was demonstrated by Harter (1985b), with the average loading of items on the athletic competence subscale ranging from .41 to .81. The reliability of this subscale was reported in the form of internal consistency, ranging from .80 to .86.

Importance of Physical Competence. The importance of athletic competence was assessed using two items dealing with athletic competence from the Importance

Rating Scale of Harter's Self-Perception Profile for Children (1985b). Similar to the athletic subscale described above, responses to these two items are scored on a 4-point scale; a score of 1 indicates low importance and a score of 4 reflects high importance.

Social Desirability of Responses. The Children's Social Desirability Scale (Crandall, Crandall, & Katkovsky, 1965) was used to assess the tendency of subjects to give socially desirable responses. The scale requires children to read a series of statements and indicate whether they agree or disagree with each by writing their response in the space provided. Two forms of the scale were used; the direct question form (i.e., circle yes or no) for children in grades 3 to 5, and the true/false format (i.e., write T or F) for children in grade 6. The reliability of the scale was reported by Crandall et al. (1965) in the form of internal consistency, ranging from .82 to .92. Test-retest reliability was also reported as .90 (for the direct question format) and .85 (for the true/false format) after a one month interval.

Procedure

The TOMI was individually administered to all children (N = 195) at their own schools. Testers included three experienced testers, and four others trained according to the guidelines described in the test manual. The Athletic subscale of Harter's Self-Perception Profile for Children, the two Importance Rating Scale items, and the Children's Social Desirability Scale were completed by the children during the same session, either individually or in small groups of up to six children. Questions from the questionnaires were read aloud to children in Grades 3 and 4.

Following completion of the questionnaires, the children who had been identified by parents or teachers (n = 50) were interviewed to determine (1) who the children had compared themselves to in making their competence judgements, and (2) what they

based their competence judgements on.

Results

Children's scores on the TOMI ranged from 0 to 12, with 74 children scoring between 0 and 1.5, 65 scoring between 2.0 and 3.5, 30 scoring between 4.0 and 5.5, and 26 scoring between 6.0 and 12.0. Regression analysis was used to test the hypothesis that perceived physical competence is influenced by severity of awkwardness, grade, the interaction of awkwardness and grade, gender, and the importance of physical competence (Keppel & Zedeck, 1989). Because the severity of awkwardness X grade interaction term is formed by the crossproduct of these two variables, high correlations between the variables and the interaction term are likely. To avoid introducing the resulting multicollinearity problems into the regression equation, Aiken and West (1991) recommend centering the predictor variables prior to the analysis. Following this procedure, the correlations among the five centered predictor variables ranged from -.018 to .183. The results of the regression analysis indicated that the model was significant, $F(5,189) = 10.27$, $p < .0001$. In addition, the R^2 value indicated that the set of independent variables entered into the regression equation (i.e., importance of being competent in physical activity, gender, grade, severity of awkwardness, and the interaction between severity of awkwardness and grade level) explained 19.3% of the variance in children's perceptions of physical competence. This suggests that there are other important factors, not included in the present study, influencing children's judgements of their own ability.

The importance of physical competence was a significant predictor of perceived physical competence ($p < .001$); the regression slope ($b = 1.467$) indicates that when other variables were held constant, children who attached higher ratings to the

importance of physical competence had higher perceptions of physical competence than those who rated the importance of physical competence as low. The slope for gender (b = -1.240, p < .05) indicates that males reported higher perceptions of physical competence (M = 18.47, SD = 3.73) than females (M = 16.64, SD = 3.71). This finding was consistent across all grade levels, as shown in Table 2-2.

Table 2-2

Means and Standard Deviations of Subjects' Perceptions of Physical Competence

	Female		Male	
Grade	M	SD	M	SD
3	16.14	3.71	17.85	4.33
4	16.30	4.27	18.93	3.22
5	17.57	3.57	18.76	3.49
6	16.84	3.32	18.96	3.22

The significance of the interaction variable indicates that the relationship between severity of awkwardness and perceptions of physical competence is conditional upon grade level (b = 0.252, p < .01). Further understanding of the meaning of this interaction was gained through plotting of the interaction and post hoc statistical testing (Aiken & West, 1991). First, the plot of the simple slopes for the regression of severity of awkwardness on perceived physical competence at each of the four grade levels is shown in Figure 2-1.

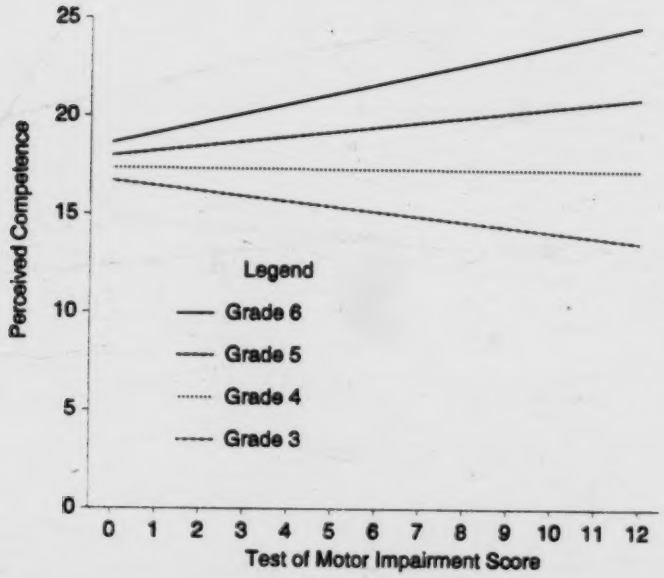

Figure 2-1. Effects of physical awkwardness on perceived competence in children from grades 3 to 6.

For children in Grades 3 and 4, higher degrees of motor impairment were associated with lower perceptions of physical competence. For children in Grades 5 and 6, however, the opposite relationship was found; perceptions of physical competence actually increased with the severity of awkwardness. Second, a post hoc analysis was conducted to test the significance of the simple regression line (or simple slope) for each grade level. This procedure involves the calculation of the standard errors of the simple slopes, followed by t-tests for significance (see Aiken & West, 1991). The results, shown in Table 2-3, indicate significant simple slopes for children in Grades 3, 5, and 6.

Table 2-3

Simple Slopes, Standard Errors of Simple Slopes, and t Values

Grade	Simple Slope	Std. Error	t
3	-0.26	.12	-2.24*
4	-0.01	.19	-0.05
5	0.24	.09	2.75**
6	0.50	.06	8.91***

*p<.05; **p<.01; ***p<.001

A Pearson product-moment correlation coefficient was calculated between subjects' perceived physical competence scores and scores on the Children's Social Desirability Scale. This strategy was used by Harter (1982) to check the tendency for children to give socially desirable responses on the Perceived Competence Scale. It was used again in the present study to explore this tendency in a sample that included children who are physically awkward. The correlation between subjects' perceived physical competence ratings and scores on the Children's Social Desirability Scale was $r = .07$. This is even lower than Harter's (1982) finding of $r = .09$, and indicates a very low tendency for subjects to give socially desirable responses on the athletic subscale of the Self-Perception Profile for Children.

Discussion

The purpose of this study was to examine the effects of severity of awkwardness and grade level on perceptions of physical competence. The importance of physical competence and gender were also included due to significant relationships found in previous research (e.g., Harter, 1985b; Stipek, 1984) between each of these variables and perceptions of competence. The significant relationship between gender and perceptions of physical competence was not surprising, as systematic gender effects

have been revealed in previous studies (Harter, 1985b). The higher perceptions of competence of male subjects may be related to the high value placed on athletic competence and sport participation for boys (Chase & Dummer, 1992; Coakley, 1987; Evans & Roberts, 1987). As discussed previously, a strong desire to be competent in a particular activity or domain may cause children to overestimate their ability (Stipek, 1984). In addition, Anderssen and Wold (1992) found that boys receive more support from significant others for being physically active than girls do. Harter contends that reinforcement for mastery attempts from significant others is a primary influence on children's self-perceptions (Brustad, 1992), leading, perhaps, to boys having higher perceptions of physical competence than girls.

The predicted effects of severity of awkwardness and grade level on perceived competence were only partially supported by the data. The significant interaction between the two variables indicated that children in Grade 3 demonstrated the hypothesized pattern of lower perceptions of physical competence associated with higher levels of difficulty or awkwardness. However, children in Grades 5 and 6 exhibited the opposite pattern in their perceptions of physical competence; higher perceptions of competence were related to more severe levels of awkwardness.

The explanation for these results may lie in the sources of information used by the children in making their competence judgements. Specifically, Horn and Weiss (1991) found that differences in the accuracy of children's ability assessments can be linked to the sources of information used in making self-judgements. For instance, subjects who underestimated their ability and those who were accurate raters indicated that peer comparison and evaluation were more important sources of information. The overestimators, on the other hand, indicated that their most important source was self-

evaluation information (e. g., degree of improvement and amount of effort expended). Perhaps some of the older, more awkward children in the present study used self-evaluation information, thus resulting in unexpectedly high perceptions of physical competence.

Although the results were not systematically analyzed, interviews with a limited number of subjects (n = 50) revealed that subjects had utilized various sources of information in making competence judgements. Some subjects indicated that they had compared themselves to peers, although several awkward children with high perceptions of athletic competence were selective about whom they compared themselves to; comments often included references to relatives or friends, as opposed to just "kids in my class". Similar to the children who overestimated their physical competence in Horn and Weiss's (1991) study, several awkward children reported that they had used self-evaluative criteria (e.g., "I try hard", "I have a good attitude"). Perhaps self-evaluative information and selective peer comparison are actually two strategies that are adopted by some older awkward children to enable positive perceptions of physical competence. Support for this hypothesis can be found in the results of a study by Frey and Ruble (1990). These researchers found that older children switched from the use of social comparison information to self-evaluative information in making competence judgements, and speculated that older children strategically select self-evaluative information as a means of maintaining motivation. Similarly, some awkward children who are aware of their limited abilities may choose strategies to maintain positive perceptions of competence.

In conclusion, the syndrome of physical awkwardness (Wall, 1982; Wall et al., 1990) suggests that children with movement difficulties develop low perceptions of

physical competence, resulting in avoidance of, or withdrawal from, physical activity situations. The results of the present study, however, indicate that the presence of movement difficulties does not necessarily lead to perceptions of incompetence. Parents and teachers of physically awkward children should look positively on this finding; there appear to be other important factors influencing awkward children's self-perceptions of ability that may actually overcome the negative effects of movement difficulties. Nevertheless, the reader should be cautious about drawing conclusions regarding the implications of the findings of the present study on the behaviour of awkward children in a specific physical activity situation. Although Harter (1978, 1981) suggests that positive perceptions of physical competence will contribute to an individual's motivation to approach and engage in physical activities, findings of previous research indicate that the relationship between general perceptions of physical competence and achievement in a specific sport or setting is relatively weak (Feltz, 1988; Roberts, 1992). Further research is needed, utilizing domain specific perceptions of ability, to examine whether participation behaviours of awkward children who overestimate their physical competence differ from those who have a more accurate view of their abilities.

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CHAPTER 3

An Achievement Goal Approach to the Investigation of Perceptions of Competence in Children who are Physically Awkward

The label "physically awkward" is applied to a heterogenous group of children with the common characteristics of having difficulty learning and performing culturally normative motor skills (Wall, 1982). They are defined as those individuals who experience "severe problems in developing adequate skills of movement in the absence of general sensory and intellectual impairments and without showing signs of overt neurological damage" (Hulme & Lord, 1986, p. 257). Predictions based in motivation theories, such as Harter's competence motivation theory (1978, 1981), suggest that the difficulties these children experience in the physical or athletic domain result in their being at risk for developing negative self-perceptions (i.e., low perceived competence), leading to withdrawal from participation in physical activity. Results of studies investigating the self-perceptions of children who are physically awkward are somewhat equivocal. Some authors report that these children have lower perceived athletic competence (Cantell, Smyth, & Ahonen, 1994; Schoemaker & Kalverboer, 1994; Ulrich, 1987; Van Rossum & Vermeer, 1990) and self-esteem (Henderson, May, & Umney, 1989; Shaw, Levine, & Belfer, 1982) than their nonawkward peers, whereas findings reported in the previous chapter indicate that at least some children with movement difficulties actually do perceive themselves as being competent in physical activity settings (see Causgrove Dunn & Watkinson, 1994; Clifford, 1987).

What enables some physically awkward children to perceive themselves as competent in games and sports? The answer to this question may lie in the criteria children use to evaluate success and failure. Researchers have assumed that the

movement difficulties experienced by these children lead to recurring failure experiences in physical activity situations, resulting in perceptions of physical incompetence. However, success and failure can only be judged in terms of an individual's goal of participation (Roberts, 1992).

Achievement goal approaches to motivation (Ames, 1992; Dweck, 1986; Nicholls, 1984, 1989) assume that individuals strive to demonstrate ability or competence in achievement situations. According to Nicholls (1984, 1989), however, there are two different conceptions of ability that may be employed in achievement contexts, which are reflected in the identification of two different types of achievement goal perspectives. Further, because ability is construed differently under each of the two goal perspectives, both the specific goals adopted and the criteria considered in the assessment of ability are also different. The goals of one perspective, referred to as task involvement (Nicholls, 1984, 1989), learning goal (Dweck, 1986; Dweck & Leggett, 1988), or mastery goal (Ames, 1984, 1992; Roberts, 1992), are to perform a task to its completion, to do one's best, and to increase skill levels. As such, assessments of competence are based on improvements in performance, learning, and mastery. Due to the subjective nature of competence judgements, task involvement is likely to lead to feelings of accomplishment and perceptions of competence, even in individuals who recognize that they are below average in ability when compared to others (Nicholls, 1989). Moreover, "because more effort is seen to lead to more learning (or because a need for greater effort indicates a harder task), the more effort expended in completing a task, the higher the perceived ability" (Nicholls, 1989, p. 85).

The second goal perspective is labelled ego involvement by Nicholls (1984, 1989), performance goal by Dweck (1986, Dweck & Leggett, 1988), ability-focused goal

by Ames (1984, 1992), and competitive goal by Roberts (1992). Individuals assuming this perspective strive to demonstrate superior ability relative to others or, failing that, to avoid demonstrating low ability relative to others; competence assessments are made in relation to the ability of others (i.e., normative evaluation). Under this goal perspective, effort is a double-edged sword (Covington & Omelich, 1979; Nicholls, 1989). For individuals with ego-oriented goals, the combination of effort and failure, or effort and success when others succeed with less effort, results in causal ascriptions to low ability.

The goal perspective adopted in a particular situation, referred to as goal involvement (Nicholls, 1989), is a function of an individual's cognitive development, his or her dispositional goal orientation, and the specific characteristics of the situation. Based on developmental work with children, Nicholls (1978, 1984, 1989, 1992; Nicholls & Miller, 1983, 1984) concluded that a child's understanding of the concept of ability influences his or her goal involvement. Nicholls described the changes that occur during the development of children's understanding of the concept of ability as a process of differentiating the concepts of luck, difficulty, and effort from ability. Until about 8 years of age, children do not understand that task difficulty is best judged with reference to the performance of others (i.e., the concept of normative difficulty). Prior to this realization, young children determine task difficulty by subjectively assessing their own chances of success; tasks are judged as hard if they are "hard for me" or easy if they are "easy for me". The concepts of skill and luck continue to be confounded until approximately age 9, when children finally recognize that effort and ability do not influence the outcomes of "luck tasks". Effort and ability are not completely differentiated in all children until about 12 years of age, at which time children develop the mature or adult understanding of ability as current capacity. Prior to this, effort is ability; people who try harder are seen

as having more ability. From the mature perspective, effort can affect performance, but performance is constrained by ability. In other words, increased effort can improve performance, but only to the limit of one's current capacity. It should be emphasized that almost all children have acquired the adult (or mature) conception of ability by 12 years of age (as opposed to at 12 years of age), meaning that many children gain this understanding at an earlier age. For example, findings of one study indicated that 31% of 5 to 6 year olds, 72% of 7 to 8 year olds, and 97% of 9 to 10 year olds had acquired the normative conception of ability (Nicholls, 1978).

Nicholls (1989) suggests that an undifferentiated conception of ability causes younger children to approach achievement situations throughout the elementary-school years with the goal of increasing mastery and, therefore, to assess their level of competence through self-referenced judgements (e.g., "did I perform better today than yesterday?"). As indicated previously, the use of self-referenced judgements may help to maintain levels of motivation and involvement necessary for further skill development, even among students who doubt their own competence relative to others. Once a child acquires the mature conception of ability, he or she realizes that ability can only be accurately judged in relation to the ability of others (i.e., through normative evaluation); perceptions of competence only occur when one performs better than others. Feelings of incompetence arise not only when a child cannot do something that others can do, but also when others can achieve the equivalent outcome with less effort. Not surprisingly, average levels of perceived ability decrease as concepts of ability and difficulty are differentiated (Nicholls, 1989).

Notwithstanding the effects of developmental changes in the conception of ability, the nature of one's understanding of the concept of ability does not wholly

determine which goal perspective will be utilized in a particular situation (Nicholls, 1990, 1992). For instance, research indicates that although young children normally make self-referenced judgements of ability, they can be induced to make use of norm-referenced judgements if another person's performance is introduced as a standard (Nicholls, 1989). Moreover, virtually all children have developed a mature conception of ability as current capacity by about 12 years of age but there continues to be considerable variation in the extent to which individuals view superior ability as necessary for success. In other words, individuals who are capable of judging their performance and/or ability from a more differentiated perspective do not always choose to do so (Nicholls, 1989).

Individual differences in preference or proneness toward a particular goal perspective also affect the type of situational goal adopted by an individual. The dispositional preference for a particular type of goal is thought to develop as a result of childhood socialization experiences, and is referred to as goal orientation (Nicholls, 1989). An individual is predominantly task-oriented if he or she tends to approach tasks with a focus on improving existing skills and learning new skills. Another person who tends to approach activities with the goal of demonstrating superior performance relative to others is described as being predominantly ego-oriented. However, task and ego orientations are considered to be independent constructs, indicating that individuals may have varying levels of predisposition toward both types of goals. Using techniques such as mean- or median-splits, canonical correlation analysis, and cluster analysis, several studies have confirmed the importance of the interaction between the two goal orientations by revealing differences in cognitions, affect, and behaviours between groups of individuals characterized as High Task/High Ego, High Task/Low Ego, Low

Task/High Ego, and Low Task/Low Ego (e.g., Ames & Archer, 1988; Ebbeck & Becker, 1994; Duda, 1988; Fox, Goudas, Biddle, Duda, & Armstrong, 1994; Hofmann & Strickland, 1995; Meece & Holt, 1993; Roberts, Treasure, & Kavussanu, 1996; Walling & Duda, 1995; White & Zellner, 1996; Williams, 1994).

Task and ego goal orientations are thought to reflect two different theories of achievement, differential beliefs about the causes of success, as well as views about the purpose of participation in an activity. For example, Nicholls and his colleagues (Nicholls, 1989; Nicholls, Cheung, Lauer, & Patashnick, 1989; Nicholls, Patashnick, & Nolen, 1985) found a positive relationship between task orientation and the belief that success in school is dependent upon effort, interest, cooperation, attempts to understand (rather than simply memorize), and to continue learning. In addition, task orientation was found to be positively related to the view that the acquisition of education enables individuals to enhance their commitment to society and their desire to continue learning. In contrast, ego orientation was found to be positively related to the belief that success in education is due to normative ability, attempts to outperform others, extrinsic factors (e.g., impressing the teacher), and the view that education is a means to an end—namely wealth and social status.

The relationships between goal orientations and personal theories of achievement have also been investigated in the context of sport and physical education. Findings of several studies reveal two different patterns of beliefs that are consistent with those found in the classroom. Ego orientation has been associated with beliefs that the purpose of sport is to enhance social status (Treasure & Roberts, 1994) and that ability (Hom, Duda, & Miller, 1993; Newton & Duda, 1993; Treasure & Roberts, 1994), deception/external factors (Hom et al., 1993; Roberts et al., 1996), and the taking of an

illegal advantage (White & Zellner, 1996) are the causes of success. In addition, studies indicate that individuals high in ego orientation endorse the legitimacy of aggressive and injurious acts during the course of play (Duda, Olson, & Templin, 1991; Dunn & Causgrove Dunn, 1997). In contrast, task orientation is positively related to the view that sport is for personal development, the promotion of lifetime health (Treasure & Roberts, 1994), and that success in sport is due to motivation and effort (Hom et al, 1993; Newton & Duda, 1993; Roberts et al., 1996; Treasure & Roberts, 1994). Sources of satisfaction in sport also vary with goal orientation, although social approval has been shown to be a source of satisfaction for both task- and ego-oriented individuals, albeit for different reasons. Task-oriented individuals tend to believe social approval is contingent upon effort and improvement, whereas ego-involved individuals generally believe that they will receive approval for outperforming others (Treasure & Roberts, 1994).

Similarly, investigations involving physical education classes have found that task orientation is positively related to the belief that success in physical education is due to intrinsic interest, effort and cooperation, and negatively related to the belief that success is due to knowing how to deceive the teacher (Walling & Duda, 1995). In contrast, ego orientation is associated with the belief that success is due to ability. In addition, Papaioannou and Macdonald (1993) found that students high in task orientation believed that the purposes of physical education are to increase mastery, cooperation and self-esteem, to promote fitness, and to prepare good citizens. Conversely, students high in ego orientation scored higher on the motives of improving social status and enhancing self-esteem.

It is thought that goal orientation is developed over time through childhood

socialization experiences (Ames, 1992; Nicholls, 1989; Nicholls et al., 1985). For instance, parents, teachers, and coaches play a significant role in the development of goal orientations by making approval dependent upon winning and outperforming others, or alternatively, upon trying hard and personal improvement (Treasure & Roberts, 1994, 1995). Not surprisingly, findings of a study by Roberts, Treasure and Hall (1994) indicate that parents high in ego orientation assessed the success of their children in terms of normative ability, and expressed a preference for normative performance feedback. Research with soccer players (Ebbeck & Becker, 1994) and basketball players (Duda & Hom, 1993) confirm a positive relationship between children's goal orientations and their perceptions of their parents' goal orientations.

The third factor influencing the type of goal adopted in a specific situation is the motivational climate of the situation. Ames (1992) and Nicholls (1989) suggest that parents, teachers, and coaches structure motivational climates by providing instructions, feedback, rewards, and explicit expectations for children that emphasize either mastery-oriented (i.e. task) or performance-oriented (i.e., ego) goals. Children assess the situational goal structure that is established by adults and adopt a consistent goal of action. For example, situations devoid of evaluative cues in which the emphasis is on performing a specific task, developing new skills, solving a problem, or learning, will likely promote task involvement (Nicholls, 1989). In contrast, situations which are constructed to emphasize evaluation (e.g., tests of valued skills, emphasis on interpersonal competition or social comparison, the use of normative feedback) as well as factors that increase one's public self awareness (e.g., the presence of an audience or a video camera) tend to promote ego involvement (Nicholls, 1984, 1989).

Ames (1992) contends that researchers cannot assume that a particular situation

will have a general motivational climate that is salient to all individuals within the environment. Research in physical education has shown that students perceive differential expectations and treatment by teachers toward high and low achievers, illustrating that it cannot be assumed that cues and demands are the same for all people in a particular situation (Martinek & Karper, 1984, 1986; Papaioannou, 1995). Moreover, even when instructions and feedback are consistent for everyone in a particular situation, there are differences in the particular cues selected by individuals and individual differences in how those cues are interpreted (Ames & Archer, 1988).

Nicholls (1989) maintains that the cues selected and the manner in which they are interpreted are influenced by the individual's goal orientation. In support of this view, research has shown that perceptions of a performance-oriented motivational climate are positively related to ego orientation (Kavussanu & Roberts, 1996; Seifriz, Duda, & Chi, 1992), while perceptions of a mastery-oriented motivational climate are positively related to task orientation (Ebbeck & Becker, 1994; Kavussanu & Roberts, 1996; Seifriz et al., 1992). In addition, there is evidence that goal orientations influence preferences for different types of performance-related information; individuals high in ego orientation requested more normative information than those high in task-orientation (Butler, 1993). In situations where participants goal orientations are in conflict with the motivational climate, Treasure and Roberts (1995) suggest that the goals selected by each individual depend upon the relative strength of his or her goal orientation compared to the motivational climate. In other words, the stronger an individual's predisposition toward task or ego involvement, the less likely that situational cues will override it. Conversely, the weaker an individual's goal orientation, the more easily it can be overridden by situational cues. As a result, situational characteristics may be more influential in

determining the goal involvement of children and young adolescents than older adolescents and adults, because children have not yet developed their personal theories of achievement, and therefore may have relatively weak goal orientations (Treasure & Roberts, 1995, p. 479).

Research conducted in the classroom indicates that perceptions of the motivational climate are related to task choice, persistence, attitudes about school, attributions for success and failure, and perceptions of competence. Specifically, the perception of a mastery-oriented climate is positively related to the use of effective strategies, a preference for challenging tasks, persistence in the face of failure, positive attitudes toward the class, and the belief that effort and success covary (Ames & Archer, 1988; Elliot & Dweck, 1988). The perception of a performance-oriented climate, on the other hand, was positively associated with ability attributions for performance and the perception of low ability during failure experiences (Ames & Archer, 1988). Within the sport domain, Seifriz et al., (1992) found that high school basketball players who perceived a mastery-oriented team climate reported higher levels of enjoyment, had higher intrinsic motivation, and were more likely to believe that effort leads to success in sport than players who perceived their team environments to be performance-oriented. Conversely, players who perceived a performance-oriented climate tended to believe that ability led to success and were more likely to report experiencing tension in basketball than those perceiving a mastery-oriented environment.

Studies investigating the effects of the motivational climate in physical education classes concur with findings in classroom and sport settings, and have shown that the perception of a mastery-oriented motivational climate is associated with more adaptive cognitions, affect, and behaviours, particularly in children with low normative perceptions

of ability. For example, junior and senior high school students with low perceptions of competence and who perceived a mastery-oriented climate in physical education classes reported levels of intrinsic motivation that were similar to students with high perceived competence who perceived either an extremely high or low mastery-oriented environment (Papaioannou, 1995). In contrast, students with low perceived ability who perceived a low mastery-oriented climate reported lower levels of intrinsic motivation. Papaioannou (1995) also found a positive relationship between the perception of a performance-oriented environment and beliefs that teachers favoured high achievers. Meanwhile, the perception of a mastery-oriented environment was related to the perception of positive teacher behaviours toward low skilled students.

The relationship between perceived competence and perceptions of the motivational climate in physical education was investigated by Newsham (1989, cited in Duda, 1992), who compared the perceptions of competence of elementary school children participating in either a 12-week mastery-oriented physical education program or a regular physical education program over the same duration. In accordance with achievement goal theories, the results revealed that the group enrolled in the mastery-oriented experimental class had higher perceptions of sport competence than children in the regular physical education program. In another study, Kavussanu and Roberts (1996) also found that college students who perceived their tennis classes to have a high mastery orientation reported feeling more competent and intrinsically motivated, expressed more interest in the activity, exerted more effort, and had higher self-efficacy than those students who perceived a low level of mastery orientation. Theeboom, De Knop and Weiss (1995), however, did not detect statistically significant differences in either perceived competence or intrinsic motivation of children enrolled in mastery- and

performance-oriented sports programs. Nevertheless, Theeboom et al. (1995) indicated that children in the mastery-oriented program reported high levels of perceived competence and intrinsic motivation during in-depth interviews, and the researchers suggested that a 3-week sport program may not have provided sufficient time to produce group differences large enough to detect statistical significance. But perhaps the explanation for the lack of statistical evidence lies in the possibility that at least some of the children in the mastery-oriented and performance-oriented programs did not perceive the goal structures of the classes that the researchers intended to create with their manipulations. Although the study included ongoing manipulation checks of teacher behaviours by independent observers, it did not include a manipulation check of the children's perceptions of the motivational climate. Therefore, the possibility that some children did not perceive the intended mastery- or performance-oriented goal structures cannot be ruled out.

The purpose of this study was to investigate, from an achievement goal perspective, why some physically awkward children report positive perceptions of competence in the physical activity domain. According to the syndrome of physical awkwardness (Wall, 1982; Wall, Reid & Paton, 1990) and Harter's (1978, 1981) competence motivation theory, lack of movement competence results in recurring failure experiences and the development of low perceptions of competence in physical activity in children who are physically awkward. However, as discussed in Chapter 2, not all awkward children perceive themselves as incompetent in physical activity. Achievement goal theorists (Ames, 1992; Dweck, 1986; Nicholls, 1984, 1989) maintain that individuals appraise their success or failure in an activity based on their goals of participation. According to this perspective, the lack of movement competence characteristic of

children who are physically awkward will only result in perceptions of failure and incompetence if the individual assumes ego-oriented goals of participation. The adoption of task-oriented goals, on the other hand, promotes perceptions of success and competence, even in individuals who are relatively incompetent (Nicholls, 1989). The participation goals adopted in a particular situation are influenced by an individual's level of cognitive development, goal orientation, and perception of the motivational climate (Nicholls, 1989).

In the present study, individual differences in goal orientations and perceptions of the motivational climate were examined in a specific physical activity context in order to explore the relationships between these variables and perceptions of competence in children who are physically awkward. Based on Nicholls' achievement goal theory (1989, 1990) and previous research, it was hypothesized that higher levels of task orientation in physical education class would heighten perceptions of a mastery-oriented motivational climate, which would result in more positive perceptions of competence due to the use of self-referenced competence judgements. Higher levels of ego orientation, on the other hand, were expected to result in the perception of a more performance-oriented climate, which focuses attention on demonstrating ability in comparison to others. Due to their difficulties in movement situations, higher perceptions of a performance climate were expected to have a negative effect on perceptions of competence in children who are physically awkward.

Method

Participants

In order to identify physically awkward participants, a motor skills test was administered to 338 children in Grades 4 to 6, from seven schools in two Canadian

cities. The sample consisted of 57 children in Grade 4 (33 boys and 24 girls), 163 children in Grade 5 (78 boys and 85 girls), and 118 children in Grade 6 (60 boys and 58 girls). Following the administration of the motor skills test, 65 children (23 boys and 42 girls) ranging in age from 9 years to 12 years (M = 11.01, SD = .91) were identified as physically awkward and comprised the final sample of the study.

Measures

Physical Awkwardness. Physical awkwardness was assessed using the Test of Motor Impairment - Henderson Revision (TOMI: Stott, Moyes, & Henderson, 1984). A detailed description of the psychometric properties of this instrument was presented in Chapter 2.

Perceived Competence. Using a similar measure of task-specific perceived competence to that employed by Vallerand and Reid (1984) and Elliot and Harackiewicz (1996), participants were asked to rate their perceived competence in a specific physical education class on a 7-point scale ranging from 1 (I'm not good at all) to 7 (I'm very good) by answering the question, "How good do you think you were in P. E. class today?". Subjects were also asked, "Why did you choose (answer child selected)?" and "What makes you think you were (answer selected) today?". These questions required participants to justify the answer they had selected, presumably making it less likely that unrealistically high (i.e., socially desirable) judgements of competence would be reported. In addition, responses to these questions revealed the types of information children considered in making their competence judgements.

Although task-specific versions have been used in previous research (e.g., Horn & Hasbrook, 1986; Theeboom et al., 1995; Weiss, Bredemeier, & Shewchuk, 1986), the perceived athletic competence subscale of Harter's (1985) Self-Perception Profile for

Children was not selected for the present study because it was felt that this instrument may encourage children to evaluate their competence by comparing themselves to other kids (i.e., from an ego-involved perspective). Specifically, the instructions for the Self-Perception Profile for Children (Harter, 1985) require participants to indicate which of two groups of children described in each item they feel they are more like. The effect of these instructions on the competence judgements of children with a task-involved goal perspective is unknown, and so this instrument was not selected for the present study.

Goal Orientation in Physical Education. A modified version of the Task and Ego Orientation in Sport Questionnaire (TEOSQ, Duda & Nicholls, 1992) was utilized to measure participants' goal orientations in physical education class. The TEOSQ measures individual differences in goal orientations in the sport context and contains 13 items, six items measuring ego orientation and seven items measuring task orientation. To complete the TEOSQ, respondents are asked to think of a successful sporting experience and then indicate their levels of agreement with each item on a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree). Factorial validity of the TEOSQ has been reported by Duda and her colleagues (Chi & Duda, 1995; Duda, 1989; 1992; Duda & White; 1992; White & Duda, 1993). Results of these studies demonstrate the orthogonal stability of the factors, and the pattern of factor loadings indicate that items loaded in accordance with theoretical predictions. The internal consistency of the task and ego orientation scales, reported in the form of coefficient alpha (Cronbach, 1951), range from .74 to .86 for task orientation, and .75 to .90 for ego orientation (Duda, 1992; Duda & White, 1992; Lochbaum & Roberts, 1993; White & Duda, 1993). Because the context of the present study was physical education class, the stem of the TEOSQ was modified from its original wording ("I feel most successful in sport when... ") to make it

specific to physical education class ("I feel most successful in gym class when... ") (see Appendix A).

Perceptions of Motivational Climate in Physical Education. A modified version of the Perceived Motivational Climate in Sport Questionnaire (PMCSQ, Seifriz et al., 1992) was utilized to measure individual differences in subjects' perceptions of the motivational climate during a physical education class. The PMCSQ contains 21 items; the performance subscale includes 12 items and the mastery subscale contains 9 items. Respondents indicate their levels of agreement with each item on a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree). Factorial validity of the PMCSQ was demonstrated by Seifriz et al. (1992) and Walling, Duda and Chi (1993). Internal consistencies of the performance and mastery scales, reported in the form of coefficient alpha (Cronbach, 1951), were .84 and .80 respectively (Seifriz et al., 1992). For the purpose of the present study, the wording of the stem and individual items was modified to make them specific to physical education classes (see Appendix B). Specifically, the original stem was modified to read "In this gym class..."; references to "players" in the original scale were changed to "classmates" or "kids", and; the term "coach" in the original scale was replaced with the term "teacher".

Procedure

Information letters and informed consent forms were sent home with 581 children in Grades 4 to 6 at the seven participating schools. A total of 346 consent forms were returned (60%), signed by both the parent and the child. The TOMI was individually administered to 338 children at their own schools by a member of the testing team; eight children were not tested due to absence on the testing day or because of injuries that prevented completion of (or otherwise affected the performance of) one or

more test items (e.g., a fractured bone, strained muscles). The testing team consisted of graduate students and senior undergraduate students in physical education who had received formal training to administer the TOMI. Training included an initial session during which the items from Age Bands 3 and 4 were explained and demonstrated to the trainees. During a second session, trainees practiced administering the TOMI and observed others administering the TOMI to children of similar ages to those in the present study. During a third training session, trainees were individually tested on their ability to administer either Age Band 3 or Age Band 4 (selected at random) according to the test protocol outlined in the manual. Based on the administration of the TOMI, 65 children (23 boys and 42 girls) were identified as physically awkward (i.e., received a score of 4 or greater) and comprised the final sample.

During a second visit to the schools, the modified TEOSQ was administered to 175 children who had completed the TOMI. This included the 65 children who had scored 4 or greater on the TOMI in addition to 110 children who had scored 3.5 or less and whose teachers permitted them to leave their classrooms to complete the questionnaire. Participants completed the TEOSQ either individually or in small groups of up to four children. A general explanation of the questionnaire was provided and children were encouraged to ask for help with any item they had difficulty understanding. Following this introduction, items were read aloud to children in Grade 4, while fifth and sixth grade children were given a choice between having the items read aloud by the tester or reading the items on their own.

A third data collection session was conducted immediately following a regularly-scheduled physical education class for each physically awkward child plus one nonawkward child who was matched on the basis of gender, age (± 6 months), and

classroom (N=130). During this session, both the Perceived Competence questionnaire and the modified PMCSQ questionnaire were completed individually by the two children. Participants received general instructions about how to complete the questionnaires and were encouraged to ask for explanations of items they had difficulty understanding. As with the TEOSQ administration procedures, items were read aloud to children in Grade 4 while those in Grades 5 and 6 chose to either have the items read aloud or to read the items themselves.

Data Analyses

Because the present study employed the TEOSQ and PMCSQ in a context other than organized sport, the factor structure and reliability of the two questionnaires were investigated. First, exploratory factor analyses were conducted using principal components analysis with orthogonal and oblique rotations. Following the exploratory factor analyses, each questionnaire was subjected to a confirmatory factor analysis (CFA) using SPSS/PC LISREL 7 (Jöreskog & Sörbom, 1989). Confirmatory factor analysis enables the researcher to specify, on theoretical grounds, the number of factors, the pattern of factor loadings, and the degree of correlation between the factors in the analysis. This permits the researcher to test whether the theoretical/hypothesized relationships between questionnaire items and the underlying constructs are consistent with the structure underlying the data. Internal consistency estimates of the reliability of the subscales of the two questionnaires were computed using coefficient alpha (Cronbach, 1951).

In order to examine the relationships among goal orientation, perceived motivational climate, and perceived competence in physically awkward children, descriptive statistics and zero order correlations between the motivational variables and

TOMI scores of awkward children were calculated. Tests of a model containing the hypothesized causal relationships among the motivational variables as described in achievement goal theory (Nicholls, 1989, Roberts, 1992) were conducted using path analysis and structural equation modeling (using SPSS/PC LISREL 7). These analyses provided estimates of the independent effects of the two goal orientations on perceptions of the motivational climate and perceived competence, in addition to the independent effects of the two perceived motivational climates on perceived competence. However, due to the potential interaction of the two goal orientations, the effects of different patterns of goal orientations (i.e., High Task/High Ego, High Task/Low Ego, Low Task/High Ego, Low Task/Low Ego) on perceived competence were examined using analysis of variance (ANOVA). The effects of different patterns of perceptions of the motivational climate on perceived competence were also analysed using the same ANOVA procedures. Finally, individual participants' data were compared to the findings of the preceding group-level analyses in order to assess the extent to which the group-level findings applied to individuals in the sample (i.e., to validate the group-level findings at the individual level).

Results

Psychometric Analysis of the TEOSQ

On the basis of both Kaiser-Guttman (i.e., the number of eigenvalues greater than 1.0) and Cattell's scree criteria (Cattell, 1978), two factors were retained from the principal components analysis (see Figure 3-1). A varimax rotation and direct oblimin transformation led to very similar factor structures with excellent simple structure on each item. A minimum factor loading of .40 was required before an item was considered to load on a particular factor; six items loaded on the factor reflecting ego orientation

and seven items loaded on the factor reflecting task orientation. The low interfactor correlation (r = -.15) obtained from the oblique transformation, and the low correlation between the scales (r = -.16, p = .07), support previous findings that task and ego goal orientations are independent constructs (Duda, 1989; Duda & White, 1992; Williams, 1994). Due to the similarity of the factor loadings produced by the orthogonal rotation and the oblique transformation, in addition to the low interfactor correlation, only the factor structure obtained from the orthogonal rotation is presented in Table 3-1.

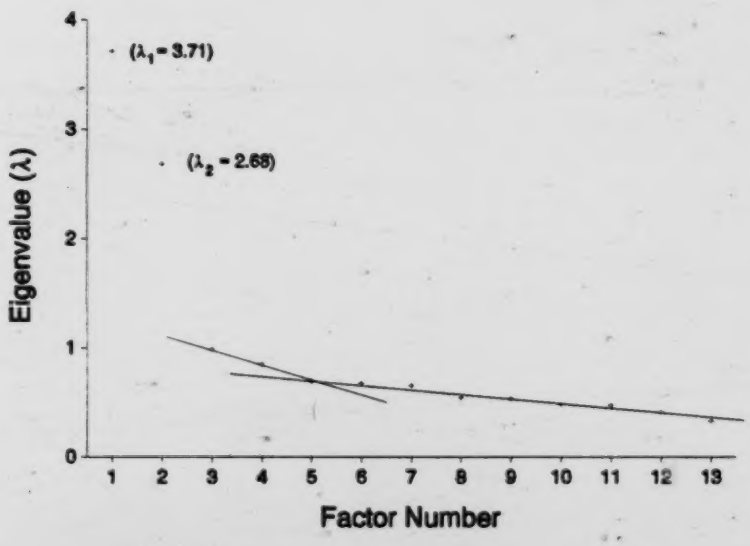

Figure 3-1. Scree plot of eigenvalues obtained from principal components analysis of the TEOSQ.

Table 3-1

Principal Components Analysis of the Modified TEOSQ (Varimax Rotation)

	Factor Loadings	
I feel most successful in gym class when...	Ego	Task
I'm the only one who can do a play or skill	**.69**	.07
I can do better than my friends	**.73**	-.16
The others can't do as well as me	**.73**	-.21
Others mess-up and I don't	**.65**	-.19
I have the most points/goals/hits/etc.	**.78**	.05
I'm the best	**.78**	.03
I learn a new skill and it makes me want to practice more	-.12	**.69**
I learn something that is fun to do	-.17	**.49**
I learn a new skill by trying hard	-.02	**.67**
I work really hard	.05	**.69**
Something I learn makes me want to practice more	-.12	**.71**
A skill I learn really feels right	.04	**.70**
I do my very best	-.05	**.60**
Eigenvalue	3.71	2.68
Percent of variance	28.60	20.60

Confirmatory factor analysis was utilized to further test whether the hypothesized factor structure of the TEOSQ was consistent with the structure underlying the data (see Figure 3-2), using the correlation matrix as input. As recommended by Schutz and Gessaroli (1993) in their discussion of the treatment of ordinal data in CFA, the distributions of the items were first examined to assess skewness and kurtosis. Only three items exhibited skewness and/or kurtosis values greater than ±1.0, indicating that maximum likelihood estimation procedures were appropriate.

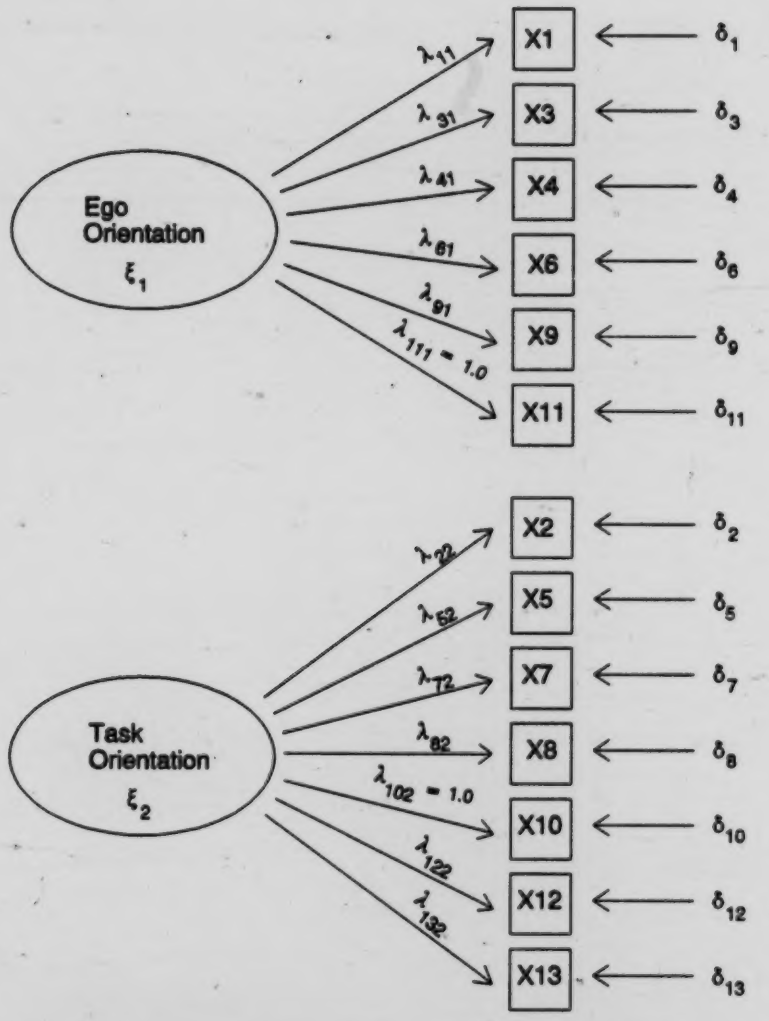

Figure 3-2. Measurement model tested for the TEOSQ using confirmatory factor analysis.

The overall goodness-of-fit of the model was assessed through examination of several indicators. The chi-square statistic tests the hypothesis that the model fits the pattern of covariation among the observed data. However, the sensitivity of the chi-square statistic to sample size and multivariate normality has lead to criticism of the hypothesis-testing approach to the assessment of model fit (Marsh, Balla, & McDonald, 1988) and the recommendation that it be used as a descriptive index of fit rather than a statistical test (Jöreskog, 1969). The chi-square/degrees of freedom ratio (χ^2/df) has also been used as a general indicator of fit, with a ratio of less than 5 indicating a good fit between the observed and model-implied correlation matrices (Hayduk, 1989). The goodness-of-fit index (GFI) is a measure of the relative amount of covariation among the observed indicators that is jointly accounted for by the model. The adjusted goodness-of-fit index (AGFI) adjusts the GFI for the degrees of freedom used to estimate free parameters (Jöreskog & Sörbom, 1989). Both the GFI and AGFI range from 0 to 1, with values greater than .90 indicating good fit. The root mean square residual (RMSR) is a measure of the average of the fitted residuals resulting from the comparison of the model estimated correlation matrix and the observed correlation matrix. An RMSR of less than .05 represents a good fit while values between .05 and .10 are considered acceptable (McAuley, Duncan, & Tammen, 1989).

For the TEOSQ, the chi-square value, χ^2 (65, N = 175) = 95.95, p = .008, suggests that the hypothesized measurement model does not correspond to the data. However, the χ^2/df value of 1.48, GFI and AGFI estimates of .92 and .89 respectively, and the RMSR of .07 all suggest a reasonably good fit between the hypothesized model and the observed data.

In addition to the overall indicators of model fit, individual model parameters

including the standardized residuals and t values were examined. Standardized residuals are estimates of the number of standard deviations the observed residuals are away from zero (Hayduk, 1989). As such, standardized residuals larger than +2.0 or less than -2.0 are usually considered to indicate a lack of fit of the specified relationship. Results of the analysis on the TEOSQ indicated that 15 of the 78 (19%) standardized residuals were outside the acceptable range of ±2.0. The t values are calculated by dividing each parameter estimate by its standard error, with a t value greater than 2.0 indicating that the estimated parameter is significantly different from zero in the population. For the present study, the statistically significant lambda (λ) estimates, analogous to a factor loadings in exploratory factor analysis, provide convergent evidence of an adequate fit of the model to the data.

Internal consistencies of the task and ego orientation scales were calculated using coefficient alpha (Cronbach, 1951). Acceptable internal consistency coefficients were obtained for both the ego orientation subscale (α = .83) and the task orientation subscale (α = .78).

Psychometric Analysis of the PMCSQ

Exploratory factor analysis (principal components analysis followed by orthogonal and oblique rotations) was conducted on the modified PMCSQ. Six factors with eigenvalues greater than 1.0 emerged, although examination of the resulting scree plot of eigenvalues (Cattell, 1978) suggested there were only two important factors (see Figure 3-3). Consequently, a second principal components analysis was conducted with the number of factors set at 2. The resulting solutions obtained from both the orthogonal rotation and oblique transformation revealed very similar patterns of factor loadings on each item. Items with a factor loading of greater than .40 on one factor and less than .40

on the other factor were considered to possess adequate simple structure; using this criteria, all 21 items were retained. Table 3-2 displays the orthogonal factor solution, with 12 items loading on Factor 1 (Performance Motivational Climate) and 9 items loading on the Factor 2 (Mastery Motivational Climate). The interfactor correlation (from the oblique transformation) was -.11, and the correlation between the two scales was -.12 (p = .16).

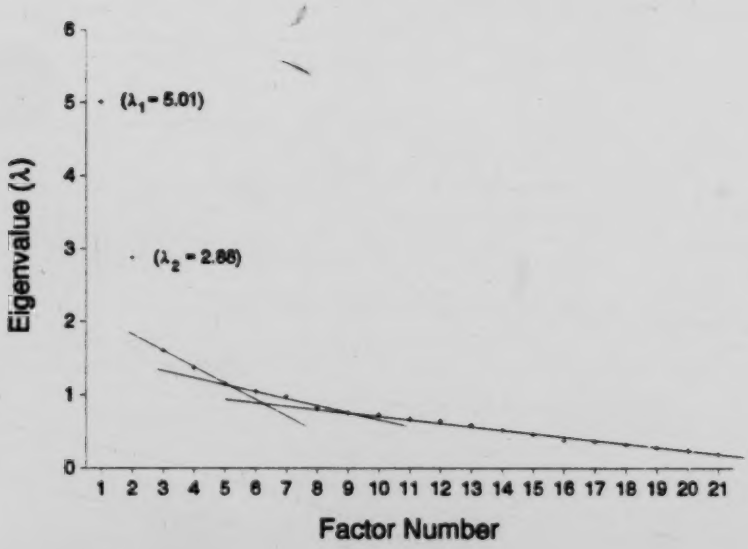

Figure 3-3. Scree plot of eigenvalues obtained from principal components analysis of the PMCSQ.

Table 3-2

Principal Components Analysis of the Modified PMCSQ (Varimax Rotation)

	Factor Loadings	
In this gym class...	Performance Factor	Mastery Factor
Kids feel good when they do better than other classmates	**.56**	.03
Kids are punished for mistakes	**.64**	.03
Kids get criticized for making mistakes	**.53**	-.17
Doing better than other students is important	**.62**	-.12
Teacher pays most attention to the "best athletes"	**.63**	-.15
Doing better than others is important	**.64**	-.08
The teacher favours some kids	**.67**	-.18
Kids are encouraged to try to do better than other students	**.71**	-.09
Everyone wishes they were the star athlete	**.47**	.29
Only the best kids "get noticed"	**.65**	-.26
Kids are afraid to make mistakes	**.53**	.16
Only a few kids can be the "stars"	**.64**	-.08
Trying hard is rewarded	-.06	**.57**
The teacher focuses on skill improvement	.06	**.60**
Each student's improvement is important	-.15	**.61**
Students try hard to learn new skills	-.19	**.60**
The teacher wants us to try new skills	-.10	**.68**
Kids like playing with and competing against good athletes	.19	**.41**
All kids in this class have an important role	-.14	**.60**
Everyone gets to try every position in every activity	-.01	**.50**
Students are encouraged to work on their weaknesses	-.11	**.55**
Eigenvalue:	5.01	2.88
Percent of variance:	23.90	13.70

Finally, the hypothesized factor structure of the modified PMCSQ (as shown in Figure 3-4 below) was tested with CFA.

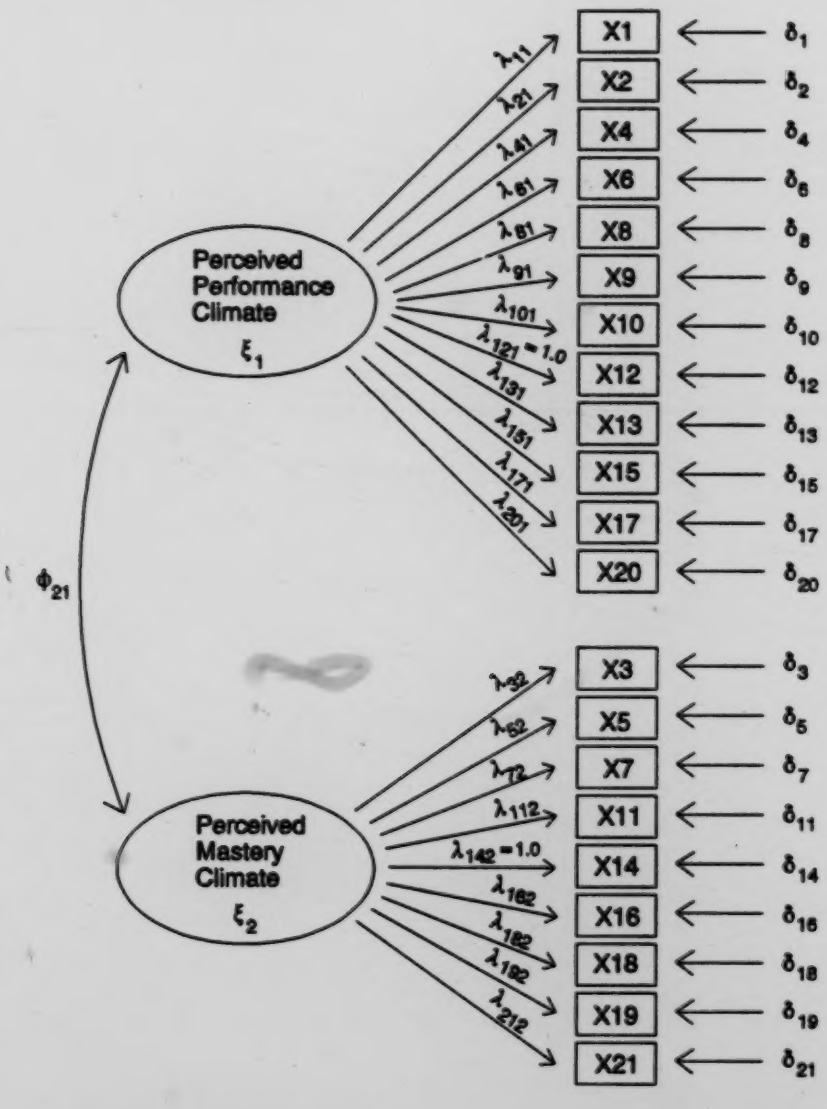

Figure 3-4. Measurement model tested for the PMCSQ using confirmatory factor analysis.

As with the CFA procedures used to assess the modified TEOSQ, the distributions of the items of the PMCSQ were initially examined for skewness and kurtosis. Although eight items revealed absolute skewness or kurtosis values greater than ±1.0, most values were smaller than ±1.0 and only three items had high skewness or kurtosis (absolute values greater than 2.0 are considered high; Chi & Duda, 1995). Thus, the correlation matrix was analysed using maximum likelihood procedures. The resulting chi-square value indicates that the hypothesized model is significantly different from the sample data, χ^2 (188, N = 130) = 407.26, p < .001. The χ^2/df ratio = 2.17, the GFI = .773, the AGFI = .721, and the RMSR = .10. Standardized residuals ranged from 5.38 to -3.32, with 36 of the 180 residuals (20%) larger than ±2.0. However, convergent validity for the hypothesized model is evident in the significant t values associated with all lambda estimates, indicating that each questionnaire item loaded significantly on the underlying factor posited in the model. The interfactor correlation was also examined and found to be negative and relatively low (r = -.31), as is consistent with previous findings (Kavussanu & Roberts, 1996; Seifriz et al., 1992; Walling et al., 1993). Overall, the results indicate an acceptable fit. In fact, the CFA results obtained in this study demonstrate a slightly better fit than the results of an earlier CFA analysis on the PMCSQ reported by Walling et al. (1993). However, following examination of the modification indices from their analysis, Walling et al. (1993) conducted a second CFA allowing a number of error covariance terms (theta deltas) to be estimated (i.e., to covary). The authors stated that the modification indices for the error covariance terms in the initial CFA revealed large residuals caused by measurement errors among items within each of the two scales. They further suggested that these large residuals are

indications of correlations between measurement errors of items within each scale, and that "it was reasonable that some of the measurement errors within a scale would be correlated" (Walling et al., 1993, p. 178). Thus, Walling et al. (1993) conducted a second CFA, allowing 17 pairs of theta deltas to covary with one another. The results of this second analysis indicated a better fit of the model: χ^2 (171, N = 169) = 346.14, p < .0001; GFI = .851; AGFI = .798; RMSR = .091. While covariance among error variances for items within the same scale may be an indication of systematic measurement error such as a testing effect due to parallel wordings (in which case it would be reasonable to allow the error estimates of those items to covary), covariance may also indicate the presence of additional common factors or multidimensional construct measurement (Gerbing & Anderson, 1984). Therefore, "the use of correlated measurement errors can be justified only when they are specified a priori .... [and] should not be used as respecifications because they take advantage of chance, at a cost of only a single degree of freedom, with a consequent loss of interpretability and theoretical meaningfulness (Bagozzi, 1983; Fornell, 1983)" (Anderson & Gerbing, 1988, p. 417). Unfortunately, Walling et al. (1993) did not reveal which pairs of theta deltas they allowed to covary, nor did they provide any specific rationale for these decisions.

Internal consistencies of the two scales, calculated using coefficient alpha (Cronbach, 1951), were .85 for the performance subscale, and .74 for the mastery subscale.

Descriptive Statistics and Correlations

The means, standard deviations, and ranges for the motivational variables and TOMI scores for the physically awkward children are shown in Table 3-3. Average values for the two types of goal orientations and the two types of motivational climates

were used (i.e., total scale score divided by the number of items) in the calculation of these statistics, as well as in the remaining analyses. Task orientation and perceived mastery climate revealed restricted ranges, while the distributions of the perceived competence was skewed toward the higher scores. The distribution of TOMI scores was both restricted in range and skewed toward the lower scores. Correlations involving these variables (i.e., task orientation, perceived mastery climate, perceived competence, and TOMI scores) may be attenuated (Crocker & Algina, 1986).

Table 3-3

Means, Standard Deviations, and Ranges of Motivational Variables and the TOMI

Variable	n	M	SD	Range
Task Orientation	64	4.23	.48	3.1 - 5.0
Ego Orientation	64	2.65	.95	1.0 - 4.7
Perceived Mastery Motivational Climate	65	3.90	.52	2.7 - 5.0
Perceived Performance Motivational Climate	65	2.58	.73	1.4 - 4.6
Perceived Competence	65	4.77	1.46	1.0 - 7.0
TOMI Scores	65	5.29	1.39	4.0 - 10.5

Table 3-4 contains observed zero-order correlations between the motivational variables and TOMI scores. Significant positive bivariate correlations were found between task orientation and perceived mastery motivational climate, between ego orientation and perceived performance motivational climate, and between perceived mastery motivational climate and perceived competence.

Table 3-4

Correlations Among the Motivational Variables and the TOMI

Variable	1	2	3	4	5	6
1. Task Orientation	1.00					
2. Ego Orientation	-.15	1.00				
3. Perceived Mastery Climate	.55**	.07	1.00			
4. Perceived Performance Climate	-.004	.51**	.08	1.00		
5. Perceived Competence	.17	.13	.33*	-.09	1.00	
6. TOMI Score	.18	.04	-.01	.04	-.02	1.00

*p<.01. **p<.001.

Analysis of Model of Hypothesized Relationships

The influence of goal orientations and perceptions of the motivational climate on perceptions of competence in physical education were investigated using both path analysis and structural equation modeling. The results of the two analyses were similar, so only the results of the structural equation modeling analysis are discussed below. However, a description of the path analysis is found in Appendix C.

Based on Nicholls (1984, 1989) achievement goal theory and previous research findings (e.g., Ebbeck & Becker, 1994; Seifriz et al., 1992), a model depicting the hypothesized causal relationships among the motivational constructs was tested using LISREL 7. As shown in Figure 3-5, task orientation and ego orientation were designated as exogenous variables (ξ's) while perceived mastery climate, perceived performance climate, and perceived competence are endogenous variables (η's). Direct effects were hypothesized from task orientation to perceptions of a mastery motivational climate and

perceptions of competence, and from perceived mastery climate to perceived competence. Therefore, an indirect effect was hypothesized from task orientation to perceived competence via the perception of a mastery climate. The model also indicates direct effects from ego orientation to perceived performance climate and perceived competence, as well as from ego orientation to perceived performance climate. Similar to the predicted relationship between task orientation, perceived mastery climate, and perceived competence, perceived performance climate was predicted to mediate an indirect effect from ego orientation to perceived competence.

The presence of measurement error in the indicator or observed variables ($\underline{X}$'s and $\underline{Y}$'s) was acknowledged through the fixing of error variances (the diagonals of the theta delta and theta epsilon matrices) at nonzero values (Hayduk, 1989). "The strategy of fixing measurement error variance at specified values gives the researcher some direct control over the meanings of the concepts" (Hayduk, 1989, p.120). The error variance for each goal orientation and perceived motivational climate subscale was calculated by subtracting the value of coefficient alpha from 1, and then multiplying the result by the total variance for the corresponding observed variable (see Table 3-5). The error variance for perceived competence was set at 20% of the total variance, based on the fact that participants' assessments of their competence may be influenced by social desirability or "wishful thinking" (Stipek, 1984).

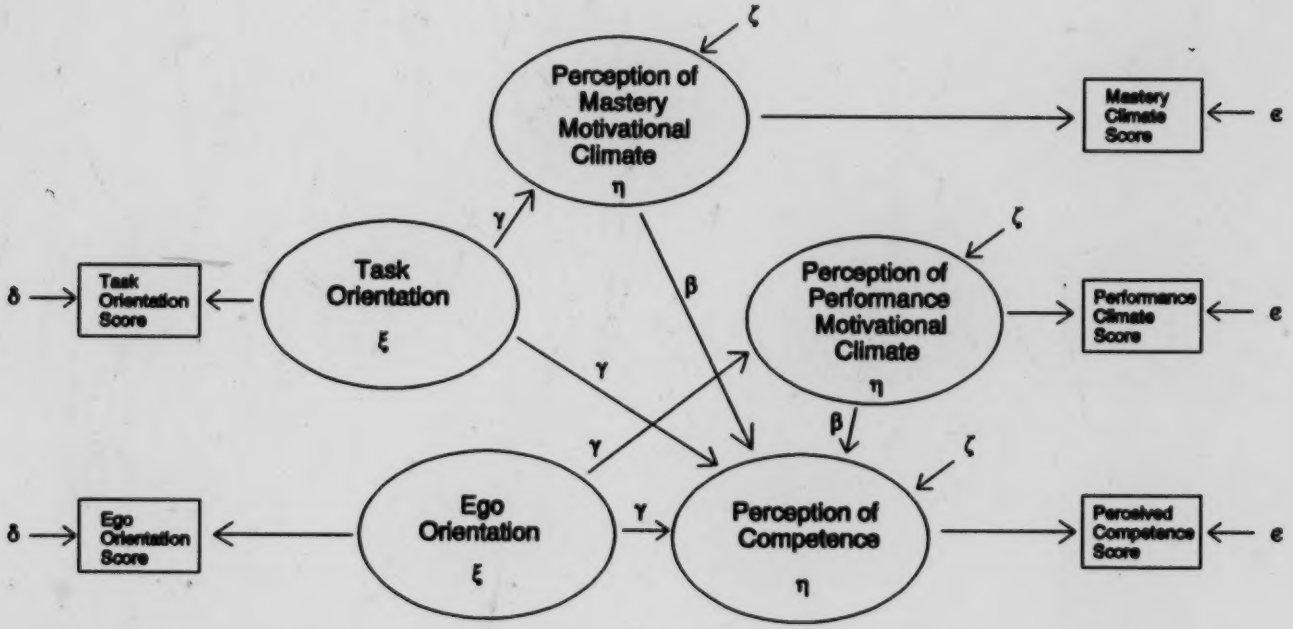

Figure 3-5. Model of effects of goal orientations and perceptions of the motivational climate on perceptions of competence.

Table 3-5

Total Variance and Error Variance for Variables in the Model

Variable	Total Variance	Error Variance
Task Orientation	.23	.05
Ego Orientation	.91	.15
Perceived Mastery Climate	.27	.07
Perceived Performance Climate	.54	.08
Perceived Competence	2.11	.42

Initially, the observed variables were evaluated for skewness and kurtosis and when none were found to have skewness or kurtosis values greater than 1.0, analysis of the correlation matrix proceeded using maximum likelihood procedures. The fit indices revealed a good fit of the model. The chi-square value (χ^2 [4, N = 64] = 3.99, p = .407) indicates that the hypothesized measurement model fits the data. However, due to the concerns stated previously regarding the suitability of the hypothesis-testing approach to the assessment of model fit (Marsh et al., 1988; Jöreskog, 1969), several other indicators of fit were examined: χ^2/df = 1.0, GFI = .98, AGFI = .91, and RMSR = .05. Standardized residuals ranged in size from .574 to -1.172; thus, there were no standardized residuals outside the range of acceptability (± 2.0). The standardized parameter estimates (path coefficients), unstandardized parameter estimates (structural coefficients), and t values are presented in Table 3-6.

Table 3-6

Parameter Estimates for Direct Effects in the Model

Path	Path Coefficient	Structural Coefficient	t value
Task Orientation - Perceived Mastery Climate	.58	.57	5.16
Task Orientation - Perceived Competence	.03	.02	.13
Perceived Mastery Climate - Perceived Competence	.43	.34	2.18
Ego Orientation - Perceived Performance Climate	.61	.64	4.99
Ego Orientation - Perceived Competence	.44	.36	1.96
Perceived Performance Climate - Perceived Competence	-.43	-.34	-2.00

Overall, the results indicate that physically awkward children with high levels of task orientation perceived the motivational climates of their physical education classes to be highly mastery-oriented which, in turn, was positively associated with perceptions of competence. Specifically, a 1 SD increase in task orientation was associated with a .58 SD increase in perceived mastery climate, and a 1 SD increase in perceived mastery climate was associated with a .43 SD increase in perceived competence. The hypothesized direct effect from task orientation to perceived competence (i.e., with other variables in the model held constant) was not significantly different from zero. However, because the model indicates that a portion of the influence of task orientation on perceived competence is mediated by perceived mastery climate, it is also important to consider the indirect effects of task orientation on perceived competence. The indirect effect of task orientation on perceived competence (equal to the product of the direct effect of task orientation on perceived motivational climate and the direct effect of perceived mastery climate on perceived competence) is .25. Thus, the total effect of task orientation on perceived competence is .28; a 1 SD increase in task orientation is

associated with a .28 SD increase in perceived competence.

The relationships among ego orientation, perceived performance climate, and perceived competence are somewhat more complicated. The significant direct effect from ego orientation to perceived competence indicates that when other variables are held constant, a 1 SD increase in ego orientation is associated with a .44 SD increase in perceived competence. In addition, the direct effect of ego orientation on perceived performance climate indicates that a 1 SD increase in ego orientation is associated with a .61 SD increase in the perception of a performance climate. However, the effect of perceived performance climate on perceived competence is negative. The combination of the path coefficients obtained in the LISREL analysis, combined with the nonsignificant bivariate correlations between ego orientation and perceived competence (r = .13) and between perceived performance climate and perceived competence (r = -.09), suggests the presence of "cooperative suppression" (Cohen & Cohen, 1975, p. 90). In other words, each of the variables (i.e., ego orientation and perceived performance climate) account for a larger proportion of the variance in perceived competence in the presence of each other than they do alone. Ego orientation is positively related to perceived competence after perceived performance climate is partialled out, and contrary to the literature, may not be detrimental to perceptions of competence. However, the net effect is that the positive association between ego orientation and perceived competence is reduced by the associated increase in perceived performance climate, which has a negative relationship with perceived competence. Specifically, the product of the two pathways comprising the indirect effect of ego orientation on perceived competence is -.26. This figure, when added to the direct effect of ego orientation on perceived competence, results in a total effect of only

.18; the perception of a performance climate reduces the positive effect of ego orientation on perceived competence.

Interaction of Goal Orientations - Group Differences

As indicated previously, an assumption of achievement goal theory is that task and ego orientations are orthogonal constructs, meaning that individuals can have different patterns of goal orientations. While the analyses conducted thus far have examined perceptions of the motivational climate and perceptions of competence associated with task and ego orientations independently, the orthogonal nature of the two goal orientations necessitates an investigation of their interaction. To this end, physically awkward children were categorized as high or low in both task and ego orientation, using the nonawkward subjects' mean scores on the TEOSQ task and ego orientation scales as criteria. For task orientation, all awkward children who scored above 4.22 on the TEOSQ task orientation scale were classified as High Task, and all those who scored below 4.22 were classified as Low Task. Similarly, awkward children who scored above 2.37 on the TEOSQ ego orientation scale were classified as High Ego, while all those who scored below 2.37 were classified as Low Ego. These High/Low classifications were then used to assign the children to one of the four goal orientation groups: (1) High Task/High Ego, (2) High Task/Low Ego, (3) Low Task/High Ego, and (4) Low Task/Low Ego. Average perceived competence scores for the four groups (shown in Table 3-7) illustrate that perceptions of ability varied with the pattern of task and ego goal orientations.

Table 3-7

Perceptions of Competence for Goal Orientations Groups

Goal Orientation Group	M	SD	n
High Task/High Ego	5.41	1.00	17
High Task/Low Ego	4.82	1.18	17
Low Task/High Ego	4.88	1.65	17
Low Task/Low Ego	4.00	1.41	13

A oneway ANOVA was conducted to test whether the differences observed in the mean perceived competence values of the four groups were statistically significant. The results indicated significant overall differences in perceived competence between the groups, $F(3, 60) = 2.78$, $p < .05$, $\eta^2 = .122$. Physically awkward children in the High Task/High Ego group had significantly higher perceptions of competence, on average, than those in the Low Task/Low Ego group, $t(28) = 3.20$, $p = .003$, Effect Size[1] = 1.18. Although there were no other statistically significant differences between groups, Effect Size calculations indicated a moderate difference between the High Task/High Ego group and the High Task/Low Ego group (Effect Size = .55), as well as moderate differences between the Low Task/Low Ego group and both the High Task/Low Ego group (Effect Size = .62), and the Low Task/High Ego group (Effect Size = .57). The presence of moderate effect sizes suggests that statistically significant differences may have been detected with a larger sample.

Interaction of Perceptions of the Motivational Climate - Group Differences

In order to examine potential differences in perceived competence associated

[1]Effect Size = $(M_{Group\ 1} - M_{Group\ 2})/SD_{pooled}$ (See Thomas, Salazar & Landers, 1991).

with different patterns of perceptions of the motivational climates, participants were categorized into four perceived motivational climate groups: High Mastery/High Performance, High Mastery/Low Performance, Low Mastery/High Performance, and Low Mastery/Low Performance. Again, nonawkward participants' mean scores on the PMCSQ (3.93 for the mastery scale and 2.35 for the performance scale) were used as cut-off scores for determining high or low classification. Average perceived competence scores for the four motivational climate groups are shown in Table 3-8. Observation of mean differences suggest that, on average, the perception of a high mastery-oriented motivational climate resulted in higher perceptions of competence than the perception of a low mastery-oriented climate, regardless of the level of performance climate perceived.

Table 3-8

Perceptions of Competence for Perceived Motivational Climate Groups

Perceived Climate Group	M	SD	n
High Mastery/High Performance	5.12	0.93	17
High Mastery/Low Performance	5.45	1.04	11
Low Mastery/High Performance	4.18	1.88	17
Low Mastery/Low Performance	4.60	1.47	20

Results of a oneway ANOVA indicated that there were no statistically significant differences in perceptions of competence between the four groups, $F(3, 61) = 2.30$, $p = .09$, although the moderate effect size estimate ($\eta^2 = .102$) suggests that statistically significant group differences may have been detected with a larger sample. Further, calculation of Effect Sizes between the four groups revealed (1) a large difference

between the High Mastery/Low Performance group and the Low Mastery/High Performance group (Effect Size = .80), (2) a moderate difference between the High Mastery/High Performance and Low Mastery/High Performance groups (Effect Size = .64), and (3) a moderate difference between the High Mastery/Low Performance and Low Mastery/Low Performance groups (Effect Size = .63). All other Effect Sizes were small.

Individual-Level Analyses

All of the preceding results were derived from group-level analytical techniques that combine or aggregate data across subjects in order to "discover regularities" (i.e., nomothetic knowledge) which are typically expressed as general- or universal-type propositions (Bouffard, 1993). However, the extent to which inferences based on aggregate data are valid when generalized to individuals depends upon "whether the techniques of summarization across individuals clarifies by abstracting the most important bits of information, or whether it obfuscates by submerging into averages individual differences that are vital to the understanding of the phenomena under investigation" (Spotts & Schontz, quoted in Pervin, 1984, p. 271). This issue is particularly important in adapted physical activity research, where heterogeneous samples are frequently encountered (Bouffard, 1993). Researchers have recommended the combined use of both group-level and individual-level analyses to assess the extent to which results based on aggregate data are generalizable at the individual level (see Dunn, 1994). In the present study, this recommendation was addressed through an examination of the number of physically awkward participants whose data support the inferences made from the group-level analyses (see Table 3-9).

The positive relationships between goal orientations and perceptions of the

motivational climate are evident in the number of children classified as High on both task orientation and perceived mastery climate, and the number of children classified as High on both ego orientation and perceived performance climate. In addition, the majority of participants in three of the four goal orientation groups perceived the corresponding pattern in the motivational climates of their physical education classes. The only exception was the High Task/Low Ego group, where the majority of children perceived either a High Mastery/Low Performance climate or a High Mastery/High Performance climate.

The relationship between the different patterns of goal orientations and perceptions of ability revealed similar patterns of results for the High Task/Low Ego and the Low Task/High Ego groups. The most striking difference was between the High Task/High Ego and Low Task/Low Ego groups. Specifically, most children classified as High Task/High Ego (14 out of 17) had high perceived competence while most of those classified as Low Task/Low Ego (9 out of 13) had low perceived competence.

Table 3-9

Number of Awkward Children with High and Low Perceptions of Competence

Perceived Motivational Climate	Goal Orientations			
	High Task/High Ego	High Task/Low Ego	Low Task/High Ego	Low Task/Low Ego
High Mastery/High Performance				
High Perceived Competence	8	4	1	0
Low Perceived Competence	1	1	1	1
High Mastery/Low Performance				
High Perceived Competence	4	4	0	2
Low Perceived Competence	0	1	0	0
Low Mastery/High Performance				
High Perceived Competence	0	1	8	1
Low Perceived Competence	1	2	2	1
Low Mastery/Low Performance				
High Perceived Competence	2	2	4	1
Low Perceived Competence	1	2	1	7

Note. High and Low classifications were made by comparing physically awkward participants' scores on the motivational variables to nonawkward participants' mean scores. For task orientation, High = score > 4.22; Low = score < 4.22. For ego orientation, High = score > 2.37; Low = score < 2.37. For perceived mastery climate, High = score > 3.93; Low = score < 3.93. For perceived performance climate, High = score > 2.35; Low = score < 2.35. For perceived competence, High = score > 4.98; Low = score < 4.98.

Overall, the data in Table 3-9 are consistent with the results of the group-level analyses and further confirm the hypothesis that children high in task orientation tend to perceive the motivational climate as mastery oriented. Furthermore, an assessment of High Perceived Competence was more likely if participants perceived a High rather than Low Mastery climate, regardless of the level of perceived performance climate. In contrast, most children who were High in ego orientation (22 out of 34) perceived the motivational climate to be highly performance-oriented. The negative relationship predicted between perceived performance climate and perceived competence was supported by the numbers in general, but was not evident in either the Low Task/High Ego group or the Low Task/Low Ego group. For children categorized as Low Task/Low Ego, none of the perceived motivational climate patterns were strongly associated with High Perceived Competence; as indicated earlier, most of these children had low perceptions of competence. Examination of the Low Task/High Ego group, however, reveals that a larger proportion of children had high perceptions of competence when they perceived a Low Mastery climate (12 out of 15) than when they perceived a High Mastery climate (1 out of 2). Caution should be taken in drawing any inferences regarding the benefits of a Low Mastery climate for the Low Task/High Ego group though, because only 2 out of 17 children in this group actually perceived a High Mastery climate. Further investigation with a larger sample of Low Task/High Ego physically awkward children, balanced across the four perceived motivational climate groups is necessary before any recommendations can be made regarding their optimal motivational climate.

Discussion

Psychometric analyses support the validity and reliability of the modified versions of the TEOSQ and the PMCSQ, which were altered for use in a physical education context with a sample that included physically awkward children. For each questionnaire, the patterns of factor

loadings and interfactor correlations were consistent with the original versions used previously for sport and classroom research. In terms of the average scores obtained on each of the scales, participants scored higher on the task orientation scale than the ego orientation scale, and higher on the mastery-oriented motivational climate scale than on the performance-oriented motivational climate scale. This cannot be interpreted to indicate that the participants of the study were more task- than ego-oriented, however, as there is no evidence that the wording of the items measuring task and ego orientation are equivalent in terms of their relationship to the underlying continuum. In other words, there is no evidence to suggest that an average score of 3.0 on both subscales is indicative of equivalent amounts of task and ego orientation. Similarly, direct comparisons between average scores on the mastery and performance subscales of the PMCSQ are also not warranted; the finding that participants scored higher, on average, on the perceived mastery climate subscale than the perceived performance climate subscale does not necessarily mean that children tended to perceive the motivational climates of their physical education classes to be more mastery- than performance-oriented. The observed differences in mean scores may simply be an artifact of the way the items are worded.

Correlations among the motivational variables supported the presence of significant relationships between task orientation and the perception of a mastery motivational climate, between ego orientation and the perception of a performance motivational climate, and between the perception of a mastery motivational climate and perceived competence. The nonsignificant correlations between perceived competence and the two goal orientations suggests the absence of direct relationships as well as the potential intermediary role of perceptions of the motivational climate. The near zero correlation between the TOMI scores (i.e., actual ability) and perceptions of competence may indicate that participants were not very accurate in judging their normative abilities, or may simply be an artifact of the restriction in

range of the TOMI scores. Another potential explanation lies in the general measure of actual ability used; the TOMI is not a measure of a child's actual attainment/ability in the particular activity following which perceived competence was assessed.

Alternatively, the low correlation between actual and perceived ability in the present study may indicate that participants used more than normative motor proficiency in making judgements about their competencies. Perceived competence was measured by asking children, "How good do you think you were in your gym class today?" instead of asking the children to compare themselves to others. In this way, it was hoped that participants would select their own criteria with which to assess their competence. Examination of the answers to the follow-up interview questions "Why did you choose (answer selected)?" and "What makes you think you did (answer selected) today?" confirmed that a variety of criteria were indeed used. For example, some children clearly considered the performance of other classmates (e.g., "I scored the most goals for the yellow team") while others used self-referenced judgements (e.g., "I tried the best I could. I did the best I could at hitting the ball and I hit it a few times"). A few children even appeared to consider both norm-referenced and self-referenced criteria (e.g., "I tried hard but I wasn't the best"). Thus, the low correlation between actual and perceived ability may reflect the use of different criteria employed by different children in the evaluation of their own competence (i.e., the use of different conceptions of ability). Previous research supports the link between the accuracy of children's ability assessments (relative to peers) and the sources of information used in making self-judgements. Specifically, Horn and Weiss (1991) found that children who either underestimated or accurately estimated their ability levels considered peer comparison in making competence judgements, while those who overestimated their ability indicated that self-evaluation was the most important informational source used.

Notwithstanding the information gained through the correlations among the motivational variables, particularly in a sample comprised of children who experience movement difficulties, this study marked the first attempt to test a model comprised of hypothesized effects of goal orientations and perceptions of the motivational climate on perceived competence in physical education. Overall, the results supported the model. The positive relationships observed between task orientation and perceived mastery climate, and between ego orientation and perceived performance climate support Nicholls' (1989) view that goal orientations influence perceptions of the motivational climate. The total effects of dispositional goal orientations on perceived competence indicated that high levels of task and ego orientations were associated with higher perceptions of competence than low levels of task and ego orientations, although in the case of task orientation, this was due to the associated influence of a perceived mastery motivational climate (i.e., there was no direct relationship between task orientation and perceived competence). The relationship between ego orientation and perceived performance climate was one of cooperative suppression; perceived performance climate functioned as a suppressor of the relationship between ego orientation and perceived competence, and ego orientation functioned as a suppressor of the perceived performance climate - perceived competence relationship. Interpretation of the suppression effects suggested that high ego orientation is actually beneficial for perceived competence, but the benefits are reduced by the associated increase in perceived performance climate which has a negative relationship with perceived competence. Therefore, even though the path coefficient calculated for the direct effect of ego orientation on perceived competence was larger than the path coefficient for the direct effect of task orientation on perceived competence (which was nonsignificant), task orientation had a larger positive <u>total</u> effect on perceived ability than did ego orientation.

At first glance, the positive direct effect of ego orientation on perceptions of competence

of physically awkward children appears to refute the expected relationship between these two variables. However, in interpreting this finding, it is important to recognize that task and ego goal orientations are independent constructs, and it is the pattern of differences (or similarities) in the strengths of each goal type that determines subsequent perceptions and behaviours (Meece & Holt, 1993). In the present study, the path coefficients obtained in the LISREL analysis for task and ego orientations on perceived competence are estimates of the independent effects of each goal orientation on perceived competence with the effects of the other goal orientation (and the motivational climates) on perceived competence held constant. This information contributes to the understanding of how task and ego orientations independently operate, in addition to how they may each contribute to a joint effect. However, for the purposes of explaining and predicting perceptions and behaviours in real world settings, the interaction of the two goal orientations necessitates consideration of patterns of goal orientations.

To investigate the interaction of task and ego orientations in the present study, physically awkward participants were categorized into four groups based their patterns of goal orientation scores (i.e., High Task/High Ego, High Task/Low Ego, Low Task/ High Ego, and Low Task/Low Ego). The pattern of observed mean perceived competence scores for the four groups revealed that, on average, the High Task/High Ego group had the highest perceptions of competence, followed by the Low Task/High Ego and High Task/Low Ego groups (which had similar mean perceived competence scores), and finally by the Low Task/Low Ego group. This pattern of descending group mean values, together with the statistically significant group difference in perceived competence scores between the High Task/High Ego group ($M = 5.41$) and the Low Task/Low Ego group ($M = 4.00$), is consistent with previous research indicating that High Task/High Ego is the most beneficial pattern of goal orientations, and Low Task/Low

Ego is the least beneficial pattern of goal orientations. For example, Hom et al. (1993) found that athletes who had high levels of both task and ego orientations tended to have high perceptions of competence in basketball. Similarly, in a physical education setting, Walling and Duda (1995) found that students in a Low Task/Low Ego group scored significantly lower than all other groups (i.e., High Task/High Ego, High Task/Low Ego, Low Task/High Ego) on scales relating to belief that success in physical education is due to intrinsic motivation and effort. Walling and Duda (1995) also reported that the Low Task/Low Ego group scored lower than other groups on scales measuring beliefs regarding the purpose of physical education (i.e., to promote mastery and cooperation, promote an active lifestyle, promote competitiveness, enhance self-esteem, teach concepts of health and fitness, develop motor skills, teach rules and strategies, have fun). In a classroom setting, Meece and Holt (1993) found that fifth and sixth grade students classified as either High Task/High Ego or High Task/Low Ego reported greater use of active learning strategies indicative of self-regulated learning (e.g., going over material not well-understood, conducting self-tests) than did Low Task/Low Ego students. Students in the Low Task/Low Ego group reported the highest use of effort-minimizing strategies (e.g., copying someone else's answers, guessing). The results of the present study, in conjunction with the results of the aforementioned studies, suggest that a high level of task orientation can overcome the negative cognitive, affective, and behavioural correlates of high ego orientation (Roberts et al., 1996). Consequently, as suggested by Roberts et al. (1996), teachers, coaches, and parents should direct their efforts toward enhancing task orientation rather than minimizing ego orientation.

With reference to the influence of different patterns of perceptions of the motivational climate on perceptions of competence, no statistically significant group differences were found. However, the moderate effect size ($\eta^2 = .102$) for the overall analysis, combined with several

moderate-to-large effect size estimates calculated between the groups, indicates that future investigations incorporating larger samples may find statistically significant group differences in perceived competence. Given the mean perceived competence values obtained in this study, and effect sizes calculated between groups, it seems reasonable to hypothesize that children who perceive a high level of mastery orientation in their physical education classes are more likely to report higher levels of perceived competence than children who perceive a low level of mastery orientation, regardless of the level of perceived performance orientation. Notwithstanding the lack of statistical significance, these findings compliment the results of the LISREL analysis discussed earlier and highlight an important implication for adults who play a prominent role in structuring the motivational climates of physical activity settings for children. Specifically, physical activity environments that are structured to promote perceptions of a mastery climate may be more likely to enable children who experience movement difficulties to maintain high levels of perceived competence, thereby preventing the development of negative self-perceptions and maladaptive behaviours associated with the syndrome of physical awkwardness. Furthermore, although goal orientation is defined as a dispositional preference for a particular type of goal perspective, "an achievement goal orientation is not a trait in the traditional understanding of such constructs....goal orientation is malleable over time and can be reconstructed by interventions and environmental influences (Ames, 1992; Nicholls, 1989)" (Treasure & Roberts, 1994, p. 26.). Therefore, the provision of a mastery motivational climate may not only benefit the self-perceptions of a child with movement difficulties in the short term, but may also contribute to lasting dispositional changes in the way the child approaches physical activity in the future.

As mentioned previously, the theories embedded within any nomological network are beneficial only to the extent that they are valid when applied to the individual. Consequently,

individual-level analyses were conducted in this study to determine how well the group-level findings actually applied to the children who comprised the sample. For the most part, the predictions of achievement goal theory (as applied to children with movement difficulties) were supported at the individual level. The exception was the finding that most physically awkward children classified as Low Task/High Ego in goal orientation, and who perceived the motivational climates of their physical education classes to be Low Mastery/High Performance, had high perceptions of competence. Based on achievement goal theory (Nicholls, 1989), it was expected that the combination of a Low Task/High Ego goal orientation and a Low Mastery/High Performance perceived climate would result in the adoption of ego-involved goals, which, in light of the movement difficulties experienced by these children, would lead to low perceptions of competence. However, perhaps the explanation for the unexpectedly high perceptions of competence lies in the assumption that all physically awkward children experienced difficulty/failure in the activities for which their perceptions of competence were assessed; perhaps this assumption was incorrect. The general nature of the motor skills test used to detect physical awkwardness (i.e., the TOMI) makes it possible that at least some of the children identified as awkward—particularly those with a moderate movement difficulty—were quite competent in the specific activity in which they participated during the study. If so, then perceptions of high ability would not be at all surprising.

Alternatively, it must be remembered that classifications of High or Low on each of the goal orientation and perceived motivational climate scales were made in relation to the mean scores of the nonawkward group. Moreover, the nonawkward group had higher mean scores on the task orientation and perceived mastery climate scales than the ego orientation and perceived performance climate scales. Consequently, a Low score on task orientation or perceived mastery climate may actually be higher than a High score on ego orientation or

perceived performance climate, respectively. In other words, although they were classified as Low Task/High Ego and Low Mastery/High Performance in relation to "the average nonawkward child", many of the awkward children who received these classifications may actually be High Task and/or High Mastery. This point is further complicated by the fact that there is no evidence to indicate that either the task and ego orientation scales, or the perceived mastery and performance climate scales, are equivalent. In any case, achievement goal theory suggests that a High Task and/or a High Mastery classification contributes to a task-involved goal perspective, which is predicted to result in high perceptions of competence.

Notwithstanding these potential explanations, it should be noted that there will always be individuals who are so idiosyncratic in nature that they defy classification (Klirs & Revelle, 1986). However, it is difficult to determine if any (or all) of the explanations discussed above are accurate without a measure of goal involvement (i.e., the goal perspective adopted in the particular situation). As a result, it is recommended that future investigations include a procedure to directly assess goal involvement.

In summary, the primary purpose of this study was to investigate the relationships between goal orientations, perceptions of the motivational climate, and perceptions of competence in children who are physically awkward. As predicted, task orientation was found to be positively related to the perception of a mastery climate, which in turn was positively related to perceived competence. Ego orientation was positively related to the perception of a performance climate, which was found to be negatively associated with perceived competence. These results are consistent with the nomological framework surrounding achievement goal theory. Trends revealed in the perceptions of competence associated with various patterns of goal orientations, as well as various patterns of perceptions of the motivational climate, suggest that awkward children may benefit most from strategies designed to enhance task orientation

and the perception of a mastery climate. However, further investigation is needed due to the limited sample included in the present study.

Future studies must continue to examine how the patterns of goal orientations differentially influence perceptions of situational characteristics and perceptions of competence of awkward children. To this end, an idiographic design may be the most appropriate research strategy in light of the difficulties associated with the recruitment of large samples of children who are physically awkward. Such an approach would also permit a detailed examination of Treasure and Roberts' (1995) hypothesis that the type of goal adopted in a particular situation is affected by the relative strength of both the individual's dispositional goal orientation and situational characteristics. Specifically, Treasure and Roberts (1995) suggest that the stronger an individual's predisposition toward task or ego involvement, the less likely situational cues will override it. Conversely, the weaker an individual's goal orientation, the more easily it can be overridden by situational cues. As a result, "children and young adolescents, who have yet to firm up their personal theories of achievement, may be more susceptible to the structure of the motivational climate than older adolescents and adults" (Treasure & Roberts, 1995, p. 479).

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CHAPTER 4

Motivational Orientation, Perceived Competence, and Participation Behaviours of Children Who Are Physically Awkward

As discussed in previous chapters, one of the central tenets of the syndrome of physical awkwardness (Wall, 1982; Wall, Reid, & Paton, 1990) is that physically awkward children withdraw from participation in physical activity as a result of the negative social, affective, and motivational outcomes associated with recurring failure in the motor domain. In support of this view, recent studies indicate that physically awkward children in Grades 1 to 4 are, on average, significantly less active than their motor competent peers during recess (Bouffard, Watkinson, Thompson, Causgrove Dunn, & Romanow, 1996) and physical education (Thompson, Bouffard, Watkinson, & Causgrove Dunn, 1994).

There is also evidence, however, to suggest that the withdrawal from participation in physical activities is not inevitable for physically awkward children. Because the research findings described above are based on the results of group-level statistical analyses, these findings relate to physically awkward children <u>in general</u> (i.e., on average), rather than to each and every physically awkward child. Furthermore, examination of descriptive statistics provided by Bouffard et al. (1996) and Thompson et al. (1994) reveal that not all physically awkward children necessarily exhibited inactive participation patterns in physical activity settings. An important question, therefore, is what enables at least some of these children to continue to participate as actively as children with higher skill levels, despite their movement difficulties? Based on the contention of achievement goal theorists that the types of goals adopted in a particular situation affect the motivational and behavioural patterns exhibited (Ames, 1992; Dweck,

1986; Maehr & Nicholls, 1980; Nicholls, 1984, 1989; Roberts, 1992), perhaps the answer to this question lies in consideration of awkward children's goals for participation and the criteria they use to evaluate success and failure.

According to achievement goal approaches to motivation, individuals strive to demonstrate ability or competence in achievement situations (Ames, 1984, 1992; Dweck, 1986; Nicholls, 1984, 1989). However, two major goal perspectives have been identified in achievement contexts which are linked to two different conceptions of ability (Nicholls, 1989). Therefore, the definition of competence and the criteria used to assess success or failure in a specific situation are dependant upon which goal perspective is employed, namely task involvement or ego involvement (Nicholls, 1989). Individuals who are task-involved strive to demonstrate mastery and personal improvement in the achievement context. Therefore, competence judgements are self-referenced, and are based on subjective assessments of learning and improvements in performance. Due to the subjective nature of competence judgements, the adoption of task goals is likely to lead to feelings of accomplishment, perceptions of competence, and adaptive behavioural patterns—even in individuals who recognize that they are below average in ability when compared to others (Nicholls, 1989). In contrast, individuals who are ego-involved strive to demonstrate superior ability relative to others, and competence assessments are based on normative evaluation (Nicholls, 1984, 1989).

As previously discussed in Chapter 3, the type of goal perspective that is adopted in a particular achievement situation is affected by both individual- and situational- characteristics. Nicholls (1989) suggests that individuals have a dispositional preference for a particular goal involvement, or goal orientation. Two main goal orientations have been identified: task orientation and ego orientation. Task orientation

refers to a tendency to approach tasks with a focus on personal mastery while ego orientation refers to a tendency to approach activities with a focus on the demonstration of superior normative ability. Goal orientations reflect individuals' conceptions of success, reasons for approaching and engaging in an activity (e.g., for extrinsic rewards and recognition versus personal satisfaction from participating), and beliefs about the causes of success and failure in particular domains (Ames, 1992; Duda, 1995; Nicholls, 1989). As a result, the tendency toward either task or ego involvement (or both, since task and ego orientations are viewed as independent constructs) is thought to be dependent upon childhood socialization experiences.

A second factor thought to affect goal involvement is the situational goal structure or motivational climate (Ames, 1992; Nicholls, 1989). The motivational climate refers to the types of goals that are emphasized in the situation, conveyed to participants through the provision of instructions, feedback, rewards, and explicit expectations by important individuals in the environment (Ames, 1992). Participants assess the motivational climate or, in other words, recognize that ability is assessed in a task- or ego-involved manner, and subsequently adopt consistent goals of action. The terms performance motivational climate and mastery motivational climate are used to describe situations that tend to promote ego involvement (e.g., situations that emphasize interpersonal competition or social comparison) and task involvement (e.g., situations that emphasize task mastery, skill development, and problem solving) respectively (Seifriz, Duda, & Chi, 1992).

As discussed in Chapter 3, however, researchers cannot assume that a particular situation will have a general motivational climate that is salient to all participants; the concept of a general motivational climate is not sensitive to individual

differences in how different individuals are treated and how they interpret their experiences (Ames, 1992; Ames & Archer, 1988; Martinek & Karper, 1984, 1986; Papaioannou, 1995a). Nicholls (1989) and Roberts (Roberts, 1992; Roberts & Treasure, 1995) contend that dispositional goal orientations (i.e., task and ego orientations) affect the subjective experience of the motivational climate, thereby affecting each individual's perceptions of the motivational climate. In support of this view, research has shown that perceptions of a performance motivational climate are positively related to ego orientation (Chapter 3; Kavussanu & Roberts, 1996; Seifriz et al., 1992), while perceptions of a mastery motivational climate are positively related to task orientation (Chapter 3; Ebbeck & Becker, 1994; Kavussanu & Roberts, 1996; Seifriz et al., 1992).

Roberts (1992) integrated the work of several leading achievement goal theorists (i.e., Ames, 1984; Dweck, 1986; Dweck & Leggett, 1988; Elliot & Dweck, 1988; Nicholls, 1984, 1989) to predict the effects of individual differences in goal orientations, perceptions of motivational climates, and perceptions of ability on achievement behaviour. Specifically, the perception of a mastery motivational climate is expected to foster adaptive achievement behaviours (i.e., behaviours that promote long-term achievement), regardless of an individual's normative perception of ability. In fact, because competence is assessed according to internal subjective appraisals of skill development, learning, and personal mastery, normative perceptions of ability are actually irrelevant within this type of motivational climate. Performance motivational climates, on the other hand, are predicted to have differential effects on behaviour, depending upon participants' perceptions of ability (Roberts, 1992). Because performance climates emphasize the goal of demonstrating superior normative ability, adaptive behaviours are expected to be observed in individuals who perceive their ability

to be high in relation to others. In contrast, individuals who assess their normative level of ability to be low are expected to adopt maladaptive behaviours (i.e., behaviours that do not contribute to long-term achievement).

The specific role of goal orientation as an antecedent of achievement behaviour is somewhat unclear in Roberts' (1992) summation. In situations where individuals' goal orientations are congruent with their perceptions of the motivational climate (i.e., an individual high in task orientation perceives the climate to be mastery-oriented, or an individual high in ego orientation perceives the climate to be performance-oriented), adaptive and maladaptive behaviours are expected to occur in the manner described in the preceding paragraph. However, in situations where goal orientations are in opposition with perceptions of the motivational climate, Roberts (1992) is uncertain as to whether an individual's goal orientation will override the motivational climate in determining the goals of action (and therefore behaviour), or vice versa. In a more recent article, however, Treasure and Roberts (1995) suggested that the achievement goals selected and the resulting behaviours depend upon the relative strength of an individual's goal orientation and the situational cues present in the environment. In other words, the stronger an individual's predisposition toward task or ego involvement, the less likely situational cues will override the goal orientation. Treasure and Roberts (1995) further suggest that situational characteristics may be more influential in determining the goal involvements of children and young adolescents than older adolescents and adults because children are generally still in the process of developing their personal theories of achievement and therefore have relatively weak goal orientations.

Although the majority of research that has examined the effects of motivational

orientation on adaptive and maladaptive behaviours has been conducted in classroom settings (primarily using self-reports or questionnaires to assess the use of covert learning strategies/behaviours and attitudes or beliefs about behaviours), results have generally been consistent with theoretical predictions. For example, Ames and Archer (1988) found that junior and senior high school students who perceived their classes to be highly mastery-oriented reported that they (1) used more learning strategies, (2) preferred more challenging tasks, (3) had more positive attitudes toward their classes, and (4) were more likely to believe that effort and success covary, in comparison to classmates who perceived a low level of mastery orientation. Similarly, Nolen (1988) examined the relationships between goal orientation, goal involvement, and the types of study strategies used by Grade 8 science students, and found that the use of deep-processing strategies was positively related to task orientation and task involvement, but not to ego orientation or ego involvement. It should be noted, however, that although Nolen (1988) utilized a questionnaire to assess strategy use, she also attempted to confirm or validate the reports with direct observations whenever possible.

Of the studies that have examined the relationships between goal orientations, perceptions of the motivational climate, goal involvement, and behaviour in sport and physical activity, very few have specifically examined overt behaviours in physical activity situations. Rather, the majority of research in this area has tended to assess either attitudes or beliefs about various adaptive and maladaptive behaviours (e.g., Duda, Olson & Templin, 1991; Duda & White, 1992; Dunn & Causgrove Dunn, 1997; Lochbaum & Roberts, 1993), behavioural intentions (e.g., Papaioannou, 1995b), or self-reported behaviours using questionnaires or interviews (e.g., Krane, Greenleaf & Snow, 1997; Newton & Duda, 1993). Nevertheless, the predictions of achievement goal theory

regarding achievement behaviours have largely been supported. For example, Krane et al. (1997) examined the behavioural correlates of ego involvement in an elite gymnast and found that ego involvement was associated with such negative behaviours as participation through injury, excessive practice behaviours following failure, acting out behaviours (e.g., crying, throwing things), and unhealthy dietary habits. In contrast, Duda, Smart, and Tappe (1989) found that among college athletes undergoing an injury rehabilitation program, task involvement was significantly related to exercise intensity (i.e., effort exerted, as rated by an athletic trainer) and completion of the program.

In a study pertaining to behaviours in physical education, Papaioannou (1995b) examined students' involvement in physical education classes that had been classified as having either a mastery motivational climate or a performance motivational climate. Results revealed that a mastery motivational climate was positively related to the amount of time teachers devoted to providing technique-related instruction and opportunities for skill practice, and negatively related to the amount of time children spent playing games. In addition, students in high rather than low mastery climates spent significantly less time engaged in maladaptive behaviours (in the form of off-task behaviours). Solmon (1995) also compared the behaviours of children in mastery- and performance-oriented physical education classes, although this study used an experimental design. Specifically, children's behaviours were observed as they attempted to learn to juggle in either a mastery climate (that emphasized individual challenge, short term goals, improvement, persistence, and cooperation) or a performance climate (that emphasized the demonstration of superior performance compared to classmates and included a "juggling contest"). Results indicated that the learners' behaviours were differentially affected by the motivational climate, with

students in the mastery climate completing more trials of the juggling task. In addition, interviews with teachers and videotapes of the practice sessions revealed instances of maladaptive behaviours such as cheating (e.g., reporting higher scores than obtained) and arguing, as well as a higher frequency of off-task behaviours in the performance climate setting, especially with students who experienced difficulty with the task.

In general, adaptive behaviours associated with task orientation, task involvement, or perceptions of a mastery climate include the selection of moderately challenging tasks (Smiley & Dweck, 1994), expressed interest in the task and effort (Duda, 1989; Duda et al., 1989; Rudisill, 1989; Seifriz et al., 1992), the use of goal setting and/or effective learning or performance strategies (Ames & Archer, 1988; Meece & Holt, 1993; Miller, Behrens, Geene & Newan, 1993; Vallerand, Gauvin, & Halliwell, 1986; Newton & Duda, 1993; Nolen, 1988), and persistence in the task, even when experiencing difficulty (Ames, 1992; Ames & Archer, 1988; Dweck, 1986; Miller et al., 1993; Smiley & Dweck, 1994; Solmon, 1995). In contrast, ego orientation, ego involvement, and perceptions of a performance climate have been associated with the avoidance of challenging tasks, lack of concentration, failure to exert optimal effort when inadequate performance relative to others appears likely (Ames, 1984; Dweck, 1986; Elliot & Dweck, 1988; Nicholls, Cheung, Lauer, & Patashnick, 1989; Smiley & Dweck, 1994; Roberts, 1992), cheating (Solmon, 1995), and self-handicapping (Rhodewalt, 1994). Self-handicapping refers to the strategic creation of obstacles to successful performance that increases the likelihood of failure but enables the performer to externalize poor performance and protect self-esteem.

The purpose of the present study was to examine the relationships between dispositional goal orientation, perceptions of the motivational climate, perceived

competence, and participation behaviours of children who are physically awkward during physical education. Wall and his colleagues (Wall, 1992; Wall et al., 1990) have suggested that the public nature of failure in the motor domain results in the development of a syndrome of physical awkwardness, which includes maladaptive behaviours such as aggression towards peers, participation-avoidance, and withdrawal from participation altogether. Although it is not possible for elementary-school-aged awkward children to completely withdraw from participation in physical education (i.e., drop out), there are other more subtle behaviours that they may employ to essentially become nonparticipants while remaining in the situation (e.g., remaining at the back of the line, engaging in a task other than the one that was assigned, or starting an argument with classmates). Consistent with the predictions of the syndrome of physical awkwardness, Thompson et al. (1994) found that, on average, physically awkward children spent more time engaged in Off-Task and Motor Off-Task behaviours during physical education than their nonawkward peers. However, some of the awkward children exhibited participation patterns similar to their motor competent peers. The focus of this study, therefore, was to investigate whether individual differences in awkward children's goal orientations, perceptions of the motivational climate, and perceptions of competence were related to differential achievement behaviour patterns in physical education.

Based on the previously outlined predictions of achievement goal theory and the results of previous research, it was expected that (1) task orientation, perceived mastery climate, and perceived competence would be positively related to adaptive behaviours and negatively related to maladaptive behaviours in physical education, (2) ego orientation and perceived performance climate would be positively associated with

maladaptive behaviours and negatively associated with adaptive behaviours, and (3) there would be a perceived competence X perceived performance climate interaction effect such that the detrimental effects of low perceived competence on behaviour would be increasingly severe among children who perceived their classes to be more performance-oriented. More specifically, the predicted relationships between perceived competence and adaptive and maladaptive behaviours were expected to be stronger in children who perceived higher levels of performance motivational climate in their physical education classes than those who perceived lower levels of performance climate.

Methods

Participants

Participants for this study included the 65 children identified as physically awkward in Chapter 3, in addition to 65 peers who were matched on the basis of age (± 6 months), sex, and classroom.

Measures

Motor Skill Level. Physical awkward and nonawkward participants were identified using the Test of Motor Impairment - Henderson Revision (TOMI) (Stott, Moyes, & Henderson, 1984). A detailed description of the psychometric properties of this instrument has been previously reported in Chapter 2.

Perceived Competence. The task-specific measure of perceived competence utilized in Chapter 3 was again used here. Briefly, participants were asked to rate their perceived competence in a specific physical education class on a 7-point scale ranging from 1 (I'm not good at all) to 7 (I'm very good) by answering the question "How good do you think you were in P. E. class today?". In an effort to minimize the effects of social

desirability on children's responses, participants were asked to justify the ratings they selected through their answers to the following two questions: "Why did you choose (answer child selected)?" and " What makes you think you were a (answer selected) today?"

Goal Orientation in Physical Education. The modified version of the Task and Ego Orientation in Sport Questionnaire (Duda & Nicholls, 1992) described in Chapter 3 was utilized to measure subjects' goal orientations in physical education. The modified-TEOSQ contains 13 items, six items measuring ego involvement and seven items measuring task involvement (see Appendix A). Psychometric properties of the modified-TEOSQ were investigated and reported in Chapter 3.

Perceptions of Motivational Climate in Physical Education. Participants' perceptions of the motivational climate in their physical education classes were measured using the modified version of the Perceived Motivational Climate in Sport Questionnaire (PMCSQ, Seifriz et al., 1992) described in Chapter 3. The modified questionnaire contains 21 items; the competitive subscale includes 12 items and the mastery subscale contains 9 items (see Appendix B). Psychometric properties of the modified PMCSQ were reported in Chapter 3.

Participation Behaviours. A modified version of the Academic Learning Time in Physical Education (ALT-PE, Siedentop, Tousignant, & Parker, 1982) observation instrument was used to measure adaptive and maladaptive participation behaviours of awkward and nonawkward children during physical education classes (see Appendix D). This modified version was used in a previous study involving children who are physically awkward (Thompson et al., 1994); the instrument was modified from its original version in an attempt to ensure that it was sensitive to the identification of behaviours that

awkward children may employ to avoid active participation on assigned tasks.

Interval recording with a "6-second-observe" and a "6-second-record" format was used. Each member of the data collection team wore one ear phone connected to a small cassette player and was cued to "observe" and "record" by a prerecorded cassette tape. During each observation interval, the coder makes a series of decisions. First, the observer decides which context the assigned behaviour/activity falls into (either General Content, Subject Matter Knowledge, or Subject Matter Motor). The coder then selects the behaviour from several specific behaviours subsumed under the appropriate context category, that best represents what the children were assigned to do. Following these decisions, the coder observes the target participant's involvement and selects the behaviour that best represents what the target child was doing. Finally, the coder selects one of several potential behaviours included in the Motor or Non-Motor learner involvement categories.

Procedure

As described in Chapter 3, information letters and informed consent forms were sent home with 581 children in Grades 4 to 6 from seven participating schools. The TOMI was individually administered to 338 of the 346 children who returned a signed consent form, at their own schools by a formally trained tester. Based on the administration of the TOMI, 65 children (23 boys and 42 girls) were identified as physically awkward (i.e., received a TOMI score of 4 or greater).

During a subsequent visit to the schools, the 65 participants who were classified as awkward and 110 of their nonawkward peers (i.e., children who had received a score of 3.5 or less on the TOMI) completed the modified TEOSQ, either individually or in small groups of up to four children (as described in Chapter 3). A third data collection

session was scheduled for the 65 awkward children plus 65 randomly selected nonawkward children, who were matched with each awkward child on the basis of age (± 6 months), sex, and classroom. This third data collection session occurred during a regularly-scheduled physical education class, at which time the participation behaviours of one physically awkward child and his or her matched nonawkward peer were observed by trained observers using the ALT-PE instrument.

Training for the ALT-PE was conducted using both videotapes and actual activity classes, until inter-observer agreement (IOA) reached 80% or greater. The IOA was calculated by the number of agreements divided by the number of agreements plus disagreements, and multiplied by 100. During this training phase, any discrepancies in observations were reviewed and decisions for future coding were established. Intermittent IOA checks were conducted during the data collection phase of the study on approximately 10% of the data collected, with IOA values ranging from 86% to 98%.

In all but two cases, there were two observers present during each of the physical education classes. One observer recorded the participation behaviours of the physically awkward child while the other observer recorded the participation behaviours of the matched nonawkward child. (It should be noted, however, that at the time of testing the observers had no knowledge regarding the motor competence classification of the children they were observing.) As a result, there were a large number of observations for each participant. In two cases, however, scheduling difficulties limited the availability of observers and the behaviours of the two target children were alternately observed and recorded by one individual. Immediately following the observed physical education class, the two target children completed the modified PMCSQ and perceived competence questionnaire as described in Chapter 3.

Data Analyses

Frequency and percent-occurrence for observed ALT-PE behaviours were calculated for each of the 130 participants. Group (i.e., awkward and nonawkward) and sex differences in the three context level categories (General, Subject Matter Knowledge, and Subject Matter Motor) were assessed with three independent multivariate analyses of variance (MANOVA). Similarly, group and sex differences among learner involvement behaviours designated as Adaptive Behaviour or Maladaptive Behaviour were also tested with a MANOVA. When a multivariate test was found to be significant, it was followed by univariate analyses of variance (ANOVA) on each variable.

For the purposes of this study, adaptive behaviours were operationalized as the ALT-PE Motor Appropriate and Motor Inappropriate learner involvement behaviour categories, as well as the On-Task behaviours coded under the Subject Matter Motor context. The Motor Appropriate category, or the percentage of class time a participant spent actively engaged at an appropriate level of difficulty, was considered adaptive because it includes specific behaviours that were most likely to lead to skill acquisition. The Motor Inappropriate category was also considered to be adaptive following consideration of the population being studied. Specifically, the movement problems of physically awkward children inevitably manifest themselves in a substantial number of Motor Inappropriate behaviour codes (signifying unsuccessful attempts to perform the activity/activities assigned during the observation period) that, while not likely to lead to effective skill acquisition, at least indicate that the child was attempting to perform the assigned task. Thus, Motor Inappropriate represents persistence in the face of failure, and as such, is an indicator of adaptive behaviour. On-Task behaviours observed during

the Subject Matter Motor Context were considered to be adaptive because the majority of activities observed contained periods of time when "active" participation was not approporiate, but participants were nevertheless appropriately engaged in the task (i.e., involved to the point that they were attentive to the progress of play). For example, games of softball included long periods of time during which fielders did not have the opportunity to be actively involved (i.e., in pursuit of or in contact with the ball), but their posture and attention were directed toward the play such that they appeared ready to become actively involved should the ball come in their direction. Specific examples of this type of behaviour were observed during the pitch and when the ball was hit either to the opposite field or foul. Similarly, in volleyball, children were deemed to be On-Task when their posture and attention were directed toward the ball while it was on the other side of the net or being played by teammates. In soccer, a child was often coded as On-Task when he or she was playing the role of defender or goalie, but the ball was down on the opponents' end of the field. Finally, maladaptive behaviours were designated as the Off- Task behaviours coded during the Subject Matter Motor context.

Descriptive statistics and intercorrelations were calculated between the motivational variables and both the Adaptive Behaviour (a composite variable comprised of the sum of the Motor Appropriate, Motor Inappropriate, and On-Task behaviours observed during the Subject Matter Motor context) and Maladaptive Behaviour (i.e., Off-Task behaviours observed during the Subject Matter Motor context) variables. It should be noted that because this study focussed on the effects of goal orientations, perceptions of the motivational climate, and perceived competence on the participation behaviours of children who are physically awkward, only the data collected from the participants who were physically awkward were included in these analyses. However,

the participation behaviour data of the nonawkward children permitted comparisons of participation behaviours of awkward children from different classes and schools, provided some degree of statistical control for differences in teaching styles, and controlled for differences in the proportion of total gym class time assigned to each context level. For both adaptive and maladaptive behaviours, this was achieved through the calculation of difference scores by subtracting the percentage of time the nonawkward child spent engaged in the behaviour from the percentage of time his or her matched awkward classmate was engaged in the same behaviour. Therefore, the Adaptive and Maladaptive Behaviour variables used in all remaining analyses are actually comprised of these difference scores. Calculation of the difference scores indicated that, on average, participants with movement difficulties spent a smaller proportion of class time engaged in adaptive behaviour than their nonawkward peers ($\underline{M}$ = -5.72, $\underline{SD}$ = 13.48), and a larger proportion of class time engaged in maladaptive behaviour than their nonawkward peers ($\underline{M}$ = 5.44, $\underline{SD}$ = 14.72). Examination of individual participants' difference scores, however, revealed that <u>some</u> awkward children spent a larger proportion of time engaged in adaptive behaviours and a smaller proportion of time engaged in maladaptive behaviours than their nonawkward peers.

Two regression analyses were used to further investigate the relationships between goal orientations, perceptions of the motivational climate, perceived competence, and behaviour in physical education classes. For the first analysis, Adaptive Behaviour was the criterion variable and regressors were added to the equation in the following order: (1) perceived competence, (2) perceived performance climate and perceived mastery climate, (3) perceived competence X perceived performance climate interaction term, and (4) task orientation and ego orientation. For

the second regression analysis, Maladaptive Behaviour was regressed on the predictor variables in the order indicated above. Finally, individual participants' data were compared to the findings of the group-level analyses in order to assess how well the group-level results portrayed the relationships among the variables at the individual level.

Results

Participation Behaviours

The observations of awkward and nonawkward children in their physical education classes were completed between the months of April to June, and September to January. Of the 65 classes observed, 36 classes were held in school gymnasiums and 29 classes were conducted outdoors. A variety of activities were observed (see Table 4-1).

Table 4-1

Activities Observed During Physical Education Classes

Activity		Number of Lessons
Basketball		2
Capture-The-Flag (strategic tag-like game)		1
Cricket		1
Dance		1
Dodgeball or Murderball Variations		10
Floor Hockey		4
Handball		1
Pillow-Polo		3
Rounders		1
Skipping		1
Soccer		5
Soccer Softball		2
Softball		13
Track & Field		8
Volleyball		1
Combination Classes:	Skipping & Dodge Ball	2
	Skipping & Line Soccer	2
	Ball Games	7
Total		65

The three MANOVA's conducted on the ALT-PE context-level categories indicated that there were no statistically significant group or sex differences in the proportions of class time devoted to the various context categories. Table 4-2 reveals that out of the total time available for physical education lessons, approximately 76% was assigned to motor activities (primarily in the form of games/competitions), 20% was

comprised of activities not directly leading to performance improvement (i.e., General), and only about 4% of class time was devoted to conveying information regarding technique, rules, and strategies (i.e., Subject Matter Knowledge).

Table 4-2

Percentage-Means For ALT-PE Context Categories by Group

	Physically Awkward		Nonawkward	
Category	M	SD	M	SD
General	19.57	16.03	19.94	15.88
Transition	15.04	13.11	15.37	12.19
Management	1.89	2.69	1.92	2.96
Break	1.05	3.69	.82	3.43
Warm Up	1.59	5.18	1.82	5.67
Subject Matter Knowledge	3.63	4.52	4.23	5.23
Technique	1.13	2.66	1.66	3.81
Strategy	.40	1.21	.35	1.23
Rules	2.09	3.73	2.22	3.48
Social Behaviour				
Background				
Subject Matter Motor	76.76	18.22	76.10	18.31
Practice	18.83	29.89	18.92	30.30
Scrimmage				
Game	56.46	35.80	55.99	35.25
Fitness	.96	5.49	.72	4.10
Warm Up Practice	.51	2.61	.48	2.48

The average percentages of time that awkward and nonawkward children spent

engaged in each of the learner involvement categories are shown in Table 4-3. In general, physically awkward children spent proportionally more class time Not Motor Engaged than nonawkward children, and nonawkward children spent proportionally more time Motor Engaged than the awkward group.

Table 4-3

Percentage-Means For ALT-PE Learner Involvement Categories by Group

	Physically Awkward		Nonawkward	
Category	M	SD	M	SD
Not Motor Engaged	77.38	14.74	73.31	15.56
Interim	2.54	4.20	2.46	4.87
Waiting	27.29	18.13	27.66	19.21
Off-Task	9.88	16.86	3.60	5.56
On-Task	29.47	15.30	31.34	15.60
Cognitive	8.21	9.29	8.26	8.73
Motor Engaged	22.45	14.68	26.70	16.27
Motor Appropriate	17.40	14.43	23.60	14.94
Motor Inappropriate	5.02	5.91	2.36	3.60
Motor Support	.21	1.52	.35	2.52
Motor Off-Task	.01	.11	.37	2.98

The MANOVA conducted on the ALT-PE behaviour categories designated as Adaptive and Maladaptive Behaviours revealed that there were significant group differences, F (4, 123) = 3.99, p = .004, η^2 = .115. Follow-up univariate tests (adjusted with a Bonferroni correction) indicated that physically awkward children experienced

difficulty with assigned tasks (Motor Inappropriate), F (1, 126) = 8.45, $p < .05$, $\eta^2 = .06$, and were engaged in Off-Task behaviours, F (1, 126) = 6.80, $p < .05$, $\eta^2 = .05$, significantly more often than their motor competent peers.

Descriptive Statistics and Intercorrelations

Means and standard deviations for the physically awkward participants on the motivational and behavioural variables are reported in Table 4-4. As indicated in Chapter 3, perceived competence, task orientation, and perceived mastery motivational climate reveal restricted ranges; correlations involving these variables may be attenuated. The intercorrelations among goal orientations, perceptions of the motivational climate, perceived competence, and participation behaviours (Adaptive Behaviour and Maladaptive Behaviour) are also shown in Table 4-4. Due to restricted range of responses on the task orientation and perceived motivational climate scales, as well as the inclusion of measurement error, however, the correlations calculated among the observed variables (as well as the regression coefficients calculated in the next section) may underestimate the magnitude of the true relationships among the constructs.

Examination of the correlations provides some initial evidence regarding the relationships between the motivational variables and behaviour. Specifically, task orientation is positively related to the perception of a mastery climate ($r = .55$), ego orientation is positively related to the perception of a performance climate ($r = .51$), and perceived mastery climate is positively related to perceived competence ($r = .33$). However, only perceived competence is significantly related to Adaptive Behaviour ($r = .29$) and Maladaptive Behaviour ($r = -.46$).

Table 4-4

Descriptive Statistics and Intercorrelations Between the Motivational and Participation Variables

	1	2	3	4	5	6	7
1. Task Orientation							
2. Ego Orientation	-.15						
3. Mastery Climate	.55***	.07					
4. Performance Climate	-.01	.51***	.08				
5. Perceived Competence	.17	.13	.33**	-.09			
6. Adaptive Behaviour[a]	-.12	.16	.08	-.08	.29*		
7. Maladaptive Behaviour[a]	.04	.03	-.02	.15	-.46***	-.47***	
M	4.22	2.37	3.93	2.35	4.98	-5.72	5.44
SD	.56	.81	.55	.64	1.11	13.48	14.72

[a]Adaptive and maladaptive behaviours refer to difference scores calculated for each matched pair by subtracting the percentage of occurrence for the nonawkward child from the percentage of occurrence for the awkward child.

*$p \leq .05$. **$p \leq .005$. ***$p \leq .001$.

Regression Analyses of the Motivational Variables Affecting Participation

Two regression analyses were conducted to examine whether the motivational variables were significant predictors of behaviour of physically awkward children during their physical education classes. The regressors were added sequentially to predict Adaptive Behaviour in the first analysis, and Maladaptive Behaviour in the second analysis. Because it is the central mediating construct of achievement behaviour (Duda, 1992; Nicholls, 1989; Roberts, 1992), perceived competence was entered into the regression equation first. Perceptions of the motivational climate (i.e., perceived mastery climate and perceived performance climate) were entered as a block on the second step. The perceived competence X perceived performance climate interaction term was entered on the third step to investigate whether or not it added to the prediction of Adaptive Behaviour, over and above the contributions of perceived competence and perceived performance climate. The two goal orientations (task orientation and ego orientation) were entered as a block on the final step. To enable the reporting of standardized regression coefficients, all variables were standardized prior to the analyses and the perceived competence X perceived performance climate interaction term was calculated from the crossproduct of the standardized variables (see Aiken & West, 1992, pp. 43-47).

As seen in Table 4-5, perceived competence was a significant predictor of Adaptive Behaviour, with higher perceptions of competence associated with a larger percentage of class time spent engaged in adaptive behaviours than low perceptions of competence. Although perceptions of the motivational climate were not significantly related to the percentage of time spent engaged in adaptive behaviours, the perceived competence X perceived performance climate interaction term added 11% to the

prediction of Adaptive Behaviour. Finally, neither task orientation nor ego orientation were significantly related to the proportion of class time that physically awkward children were engaged in adaptive behaviours.

Table 4-5

Summary of Regression Analysis of Adaptive Behaviour on Motivational Variables

Variable	β	p	R	R^2	R^{2CHA}
Step 1			.29	.08	.08
Perceived Competence	.29	.02			
Step 2			.29	.09	.01
Perceived Mastery Climate	-.01	.94			
Perceived Performance Climate	-.06	.66			
Step 3			.44	.20	.11
Interaction Term	.32	<.01			
Step 4			.47	.22	.02
Task Orientation	-.13	.38			
Ego Orientation	.13	.36			

Examination of the standardized residuals for the regression of Adaptive Behaviour on the motivational variables revealed the presence of one outlier (i.e., > 3 SD). Examination of the ALT-PE data revealed that this child received a large number of Adaptive Behaviour codes in comparison to his matched nonawkward peer during a class comprised largely of a basketball game. The nonawkward participant had received a large proportion of Waiting codes, suggesting that he had spent a great deal of time on the sidelines waiting to be substituted into the game. In order to determine whether the outlier was influential in affecting the regression solution, the associated value for

Cook's distance was examined (Stevens, 1996). "Cook's distance (CD) is a measure of the change in the regression coefficients that would occur if this case was omitted, thus revealing which cases are the most influential in affecting the regression equation" (Stevens, 1996, p. 116); a CD value greater than 1.0 is considered large. The value calculated for the outlier in the regression of Adaptive Behaviour on the motivational variables was .30, indicating that while this individual was a statistical outlier, his data did not have a large effect on the regression solution. Therefore, no further consideration was given to the removal of the outlier from the analysis.

Further understanding of the meaning of the perceived competence X perceived performance climate interaction was gained through plotting the interaction and post hoc statistical testing (Aiken & West, 1991). The plot of the simple slopes for the regression of Adaptive Behaviour on perceived competence at three levels of perceived performance climate is shown in Figure 4-1. Note that the levels of perceived competence and perceived performance climate were computed at 1 SD above the mean (high), the mean (moderate), and 1 SD below the mean (low). Among awkward children who perceived a low level of performance climate during physical education, higher levels of perceived competence were associated with slightly smaller percentages of adaptive behaviours. In contrast, for children who perceived medium or high levels of performance climate, higher perceptions of competence were associated with larger percentages of class time spent engaged in adaptive behaviours.

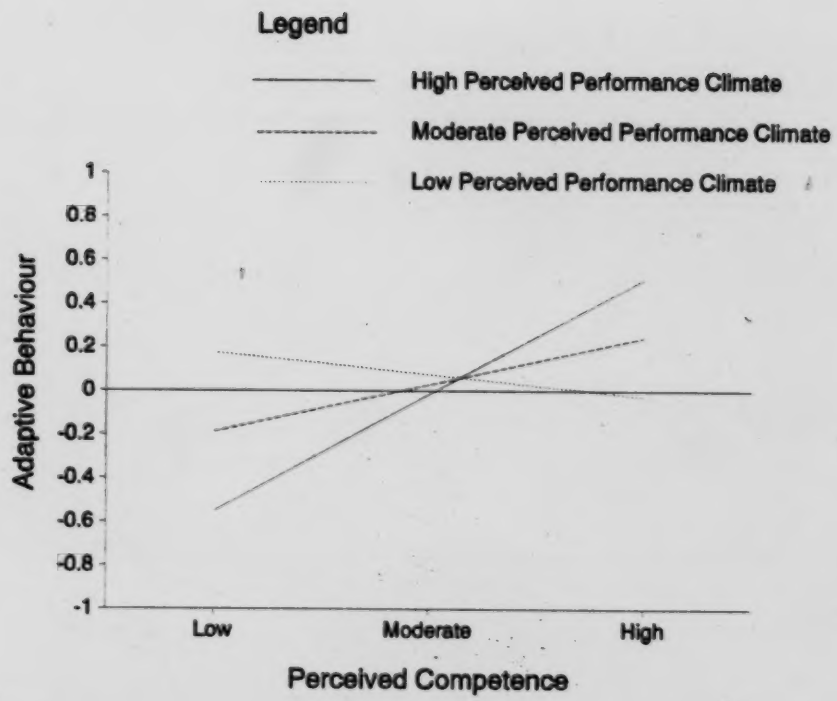

Figure 4-1. Effects of perceived competence on adaptive behaviour at three levels of perceived performance climate.

The results of the significance tests for the simple slopes (see Table 4-6) indicate that only the slope for children who perceived the motivational climates of their physical education classes to be highly performance-oriented was statistically significant; perceived competence was not statistically related to the percentage of class time spent engaged in adaptive behaviours for awkward children who perceived low or moderate levels of performance climate in their physical education classes.

Table 4-6

Simple Slopes for Regression of Adaptive Behaviour on Perceived Competence at Three Levels of Perceived Performance Climate

Level of Perceived Performance Climate	β	t	p
Low	-.10	-.55	.59
Moderate	.22	1.71	.09
High	.53	3.64	<.01

The results of the second regression analysis (see Table 4-7) revealed that perceived competence had a significant negative effect on Maladaptive Behaviour. Specifically, awkward children with higher perceptions of competence spent a smaller proportion of class time engaged in maladaptive behaviours than those with lower perceptions of competence. Similar to the results of the previous regression equation, the results of the second and third steps of this analysis revealed that while perceptions of the motivational climate were not related to the percentage of class time spent engaged in maladaptive behaviours, the specific effect of perceived competence on maladaptive behaviour was moderated by perceptions of a performance motivational climate. Again, with other variables in the model controlled for, neither task orientation

nor ego orientation added to the prediction of Maladaptive Behaviour.

Table 4-7

Summary of Regression Analysis of Maladaptive Behaviour on Motivational Variables

Variable	β	p	R	R^2	R^{2CHA}
Step 1			.46	.21	.21
Perceived Competence	-.46	<.01			
Step 2			.49.	.24	.03
Perceived Mastery Climate	.14	.26			
Perceived Performance Climate	.10	.40			
Step 3			.59	.35	.11
Interaction Term	-.31	<.01			
Step 4			.60	.36	.01
Task Orientation	.02	.89			
Ego Orientation	.12	.37			

Again, observation of the standardized residuals revealed the presence of one statistical outlier. One awkward child received a very large number of Off Task behaviour codes (comprising 80% of the lesson), which resulted in the calculation of a very large, positive score on Maladaptive Behaviour. Notes recorded by the research assistant on the ALT-PE form indicated that this child had sat to the side and watched her classmates while they practised high jump (which was the focus of the lesson). When asked why she wasn't participating, the student had replied, "I can't go over the bar without knocking it down and I have never been good at it. I have tried it and some people laugh at me and I guess I can't jump high enough". Nevertheless, observation of the CD value calculated for the outlier (CD = .55) indicated that she did not have a large

influence on the regression solution.

The plot of the significant perceived competence X perceived performance climate interaction (shown in Figure 4-2) revealed that perceived competence had very little affect on Maladaptive Behaviour for awkward children who perceived a low level of performance climate in physical education. However, for participants who perceived a moderate or high performance climate, the relationship between perceived competence and Maladaptive Behaviour was negative; higher perceptions of competence were associated with proportionately fewer maladaptive behaviours.

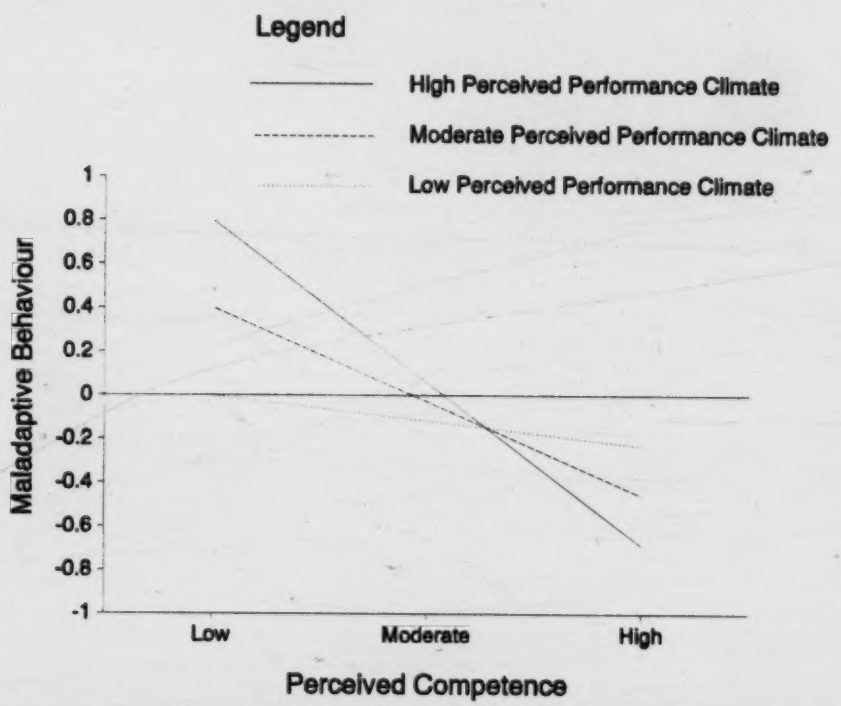

Figure 4-2. Effects of perceived competence on maladaptive behaviour at three levels of perceived performance climate.

The results of the significance tests on the simple regression slopes at each level of perceived performance climate are shown in Table 4-8. The effects of perceived competence on maladaptive behaviour were significantly different from zero for children who perceived moderate and high levels of performance climates in their physical education classes.

Table 4-8

Simple Slopes for Regression of Adaptive Behaviour on Perceived Competence at Three Levels of Perceived Performance Climate

Level of Perceived Performance Climate	β	t	p
Low	-.16	-.70	.48
Moderate	-.43	-3.79	<.01
High	-.74	-5.50	<.01

Individual-level Analyses

As discussed in Chapter 3, the heterogeneous nature of the physically awkward population necessitates an examination of the data at the individual-level in order to assess how well the inferences based upon the results of the group-level statistical analyses apply to individuals in the sample. Moreover, because the group-level analyses were limited to the physically awkward participants' data, the inferences based on the results apply only to this population. For example, the significant regression slope for perceived competence on Adaptive Behaviour indicated that awkward children with high perceptions of competence engaged in more adaptive behaviours than awkward children with low perceptions of competence. While these results are certainly of interest, the individual-level analysis permits the assessment of the generalizability of

the group-level findings to focus on the subgroup of physically awkward children who engaged in (1) as many or more adaptive behaviours as their nonawkward peers, and/or (2) as few or fewer maladaptive behaviours as their nonawkward peers. The procedure used in Chapter 3 was again used here; physically awkward children were initially classified as High and Low on each of the motivational and behavioural variables, and then the relationships among the variables were examined with reference to the number of individuals whose data supported the group-level results.

The individual-level examination of the relationships between perceived competence and behaviour are illustrated in Table 4-9. The group-level finding of a significant negative relationship between perceived competence and Maladaptive Behaviour was supported at the individual-level by the proportion of children classified as High on perceived competence and Low on Maladaptive Behaviour relative to (1) their matched nonawkward peers, and (2) the "average" physically awkward child. Specifically, of the awkward children with High perceived competence, 55% engaged in as few or fewer maladaptive behaviours than their matched nonawkward peers, and 73% engaged in as few or fewer maladaptive behaviours than the average for awkward children. In addition, most awkward children with Low perceived competence were classified as High on Maladaptive Behaviour relative to their nonawkward peers (i.e., 64% of awkward children who had Low perceived competence engaged in maladaptive behaviours more often than their matched nonawkward peers).

With reference to the group-level analysis that revealed a significant positive relationship between perceived competence and Adaptive Behaviour, 80% of awkward participants with Low perceived competence (n = 20) engaged in fewer adaptive behaviours than their respective matched nonawkward peers. In contrast, however, the

majority of awkward children with High perceptions of competence (i.e., 60%) also exhibited fewer adaptive behaviours than their matched nonawkward peers (although most awkward children with High perceived competence did engage in adaptive behaviours more often than the average value for awkward children).

Table 4-9

Numbers of Awkward Children Classified as High and Low in Adaptive and Maladaptive Behaviours

	Perceived Competence	
Participation Behaviours	High	Low
Adaptive Behaviours		
High	16[a] (25)[b]	5[a] (11)[b]
Low	24[a] (15)[b]	20[a] (14)[b]
Maladaptive Behaviours		
High	18[a] (11)[b]	16[a] (11)[b]
Low	22[a] (29)[b]	9[a] (14)[b]

Note. High and Low classifications on Perceived Competence were made in relation to the mean score for nonawkward participants (4.98).

[a]High and Low classifications are in reference to nonawkward matched peer's score: High Adaptive Behaviour = score ≥ matched nonawkward peer's score; Low Adaptive Behaviour = score < nonawkward matched peer's score; High Maladaptive Behaviour = score > nonawkward matched peer's score; Low Maladaptive Behaviour = score ≤ nonawkward matched peer's score.

[b] High and Low classifications resulted from the comparison of each awkward child's score to the average score for awkward children on Adaptive Behaviour (-5.72) and

Maladaptive Behaviour (5.44).

As described earlier, the group-level analyses revealed statistically significant perceived competence X perceived performance climate interactions on Adaptive and Maladaptive Behaviours. The individual-level analyses of these relationships revealed that the majority of awkward children classified as High on both perceived performance climate and perceived competence exhibited a High level of adaptive behaviours relative to (1) the average value for awkward children, and (2) their nonawkward matched peers (see Table 4-10). In contrast, most of the awkward children classified as High on perceived performance climate and Low on perceived competence engaged in fewer adaptive behaviours than both the average for nonawkward children, and their nonawkward matched peers. The pattern of results was different again for awkward children who perceived a Low performance climate; most awkward children classified as Low on perceived performance climate engaged in fewer adaptive behaviours than their nonawkward matched peers, irrespective of the level of perceived competence.

As was predicted, most awkward children who were classified as High on both perceived performance climate and perceived competence exhibited fewer maladaptive behaviours than (1) the average for awkward children, and (2) their nonawkward matched peer. Moreover, all of the awkward children who scored High on perceived performance climate and Low on perceived competence engaged in more maladaptive behaviours than their nonawkward matched peers. This pattern of results was reversed for awkward children classified as Low on perceived performance climate.

Given these individual-level analyses, it appears that the group-level analytical results are supported at the individual level. For the most part, the generalizability of the

inferences based on the group-level analyses extends not only to awkward children in relation to other awkward children, but also to awkward children in relation to their nonawkward peers.

Table 4-10

Individual-Level Analysis of the Perceived Competence X Perceived Performance Climate Interaction on Adaptive and Maladaptive Behaviours

	High Performance Climate		Low Performance Climate	
Participation Behaviour	High Perc. Competence	Low Perc. Competence	High Perc. Competence	Low Perc. Competence
Adaptive				
High	12[a](15)[b]	3[a](4)[b]	4[a](10)[b]	2[a](7)[b]
Low	10[a](7)[b]	9[a](8)[b]	14[a](8)[b]	11[a](6)[b]
Maladaptive				
High	8[a](5)[b]	12[a](5)[b]	10[a](6)[b]	6[a](4)[b]
Low	14[a](17)[b]	(7)[b]	8[a](12)[b]	7[a](9)[b]

Note. High and Low classifications resulted from comparisons of awkward children's scores to the mean score for nonawkward children on Perceived Competence (4.98) and Perceived Performance Climate (2.35).

[a]High and Low classifications are in reference to nonawkward matched peer's score: High Adaptive Behaviour = score ≥ matched peer's score; Low Adaptive Behaviour = score < nonawkward matched peer's score; High Maladaptive Behaviour = score > nonawkward matched peer's score; Low Maladaptive Behaviour = score ≤ nonawkward matched peer's score.

[b] High and Low classifications resulted from the comparison of each awkward child's score to the average score for awkward children on Adaptive Behaviour (-5.72) and

Maladaptive Behaviour (5.44).

Discussion

Consistent with the definition of physical awkwardness and the findings of previous research (Thompson et al., 1994), on average, the physically awkward children in this study experienced significantly more difficulty (as indicated by a higher MI percent-average) with assigned tasks than their motor competent peers. In accordance with the predictions of the syndrome of physical awkwardness, awkward children generally spent less class time engaged in adaptive behaviours and more time engaged in maladaptive behaviours in comparison to their peers. Although the physically awkward children in this study could not completely withdraw from (i.e., drop out of) physical education class, they were able to employ other behavioural strategies to avoid participation. Some of the more subtle behaviours that were observed by the research team included (1) faking an injury, (2) starting a fight or argument with classmates, and (3) switching lines (i.e., just before reaching the front of a line, the child moved to the end of another line, thereby ensuring that it was never "her turn" to perform). Less subtle behaviours included sneaking back into the school during a class held outdoors, and asking to get a drink or to use the bathroom and then avoiding returning to the class until retrieved by the teacher or classmate.

Notwithstanding the general findings described above, descriptive statistics and individual-level analyses confirmed that <u>some</u> physically awkward children actually displayed ALT-PE involvement patterns (e.g., percentage of class time involved in behaviours coded as motor appropriate, motor inappropriate, on-task, and off-task) that were similar to those of the nonawkward children. Further, some awkward children

spent as much or more class time as their nonawkward peers engaged in adaptive behaviours, and less class time engaged in maladaptive behaviours.

The primary purpose of this study was to investigate the relationships among goal orientations, perceptions of the motivational climate, perceived ability, and participation behaviours of physically awkward children, to determine whether differences in behaviours were associated with individual differences in the motivational variables. The finding of a significant interaction between perceived competence and perceived performance climate not only confirms the prediction of achievement goal theory (Elliot & Dweck, 1988; Nicholls, 1989; Roberts, 1992) that the effect of a perceived performance climate on behaviour is dependent upon the level of perceived competence, but also that the magnitude of this relationship is moderated by the extent to which the climate is perceived to emphasize ego-involved goals (i.e., the level of perceived performance climate). In a high performance climate, awkward children who had high perceptions of competence displayed more adaptive behaviours and fewer maladaptive behaviours than awkward children who had low perceptions of competence. In contrast, for awkward children who perceived low levels of a performance climate, perceived competence was not related to the proportion of class time spent engaged in adaptive and maladaptive behaviours.

Contrary to the findings of previous studies (e.g., Papaioannou, 1995b; Solmon 1995), the present study did not indicate a significant relationship between the perception of a mastery climate and adaptive achievement behaviours. There was, however, a significant correlation between perceived mastery climate and perceived competence ($r = .33$; $r = .43$ corrected for unreliability). This significant relationship likely resulted from the measure of perceived competence adopted in this study which allowed

participants to assess their competence using either task-involved or ego-involved criteria; it would only be natural for children who perceived an emphasis on task-involved goals in their physical education classes (e.g., an emphasis on improvement, learning, trying hard) to use this criteria to assess their competence. However, the effect of the correlation between perceived competence and perceived mastery climate, in combination with their order of entry into the regression equation (i.e., perceived competence was entered prior to perceived mastery climate), resulted in a minimal contribution by perceived mastery climate, over and above the contribution of perceived competence, to the prediction of Adaptive Behaviour. Similar arguments can be put forth to explain the nonsignificant relationships between task and ego orientations and achievement behaviours. Specifically, the correlation between task orientation and perceived mastery climate (r = .55; r = .73 corrected for unreliability) limited the contribution of task orientation to the prediction of adaptive behaviour, and the correlation between ego orientation and perceived performance climate (r = .51; r = .61 corrected for unreliability) limited the contribution of ego orientation to the prediction of maladaptive behaviour (over and above the contributions of variables already entered into the regression equations).

While the correlations among the motivational variables and their order of entry into the regression equation at least partially explain why the significant relationship between goal orientations and behaviours found in previous studies was not found here (e.g., Duda, Olson & Templin, 1991; Duda & White, 1992; Dunn & Causgrove Dunn, 1997; Lochbaum & Roberts, 1993), two additional points are worth noting. First, previous studies investigating the correlates of adaptive and maladaptive achievement behaviours have tended to focus on either goal orientations or perceptions of the

motivational climate; few studies have included both goal orientations and perceptions of the motivational climate. Therefore, findings of significant relationships between goal orientations and behaviours may be more accurately attributed to goal orientations confounded with the effects of perceptions of the motivational climate. Second, as mentioned in the introduction, most previous studies have not included direct observations of overt behaviours, but have instead measured behavioural attitudes, beliefs, or intentions, or have used retrospective self-reports to assess overt behaviours. Therefore, the disparate results may be the result of different measures employed.

In support of the predictions of achievement goal theory outlined by Roberts (1992), the bivariate correlations and hierarchical regression analyses revealed significant relationships between perceived competence and Adaptive and Maladaptive Behaviours. More specifically, the regression results indicated that physically awkward children with higher perceptions of competence generally spent a larger proportion of class time engaged in adaptive behaviours (i.e., successfully performing assigned tasks, persisting even when having difficulty, and maintaining a position or stance indicating readiness to participate when given the opportunity) than those with low perceptions of competence. In addition, higher perceptions of competence were associated with relatively fewer maladaptive behaviours (i.e., off-task behaviours) during physical education. The individual level analysis supported these findings and also revealed that most of the awkward children who had high perceptions of competence exhibited fewer maladaptive behaviours than their nonawkward matched peers. Moreover, most awkward children with low perceptions of competence engaged in (1) fewer adaptive behaviours and (2) more maladaptive behaviours, than their respective nonawkward matched peers.

The significant interactions between perceived competence and perceived performance climate revealed that the effects of perceived competence on adaptive and maladaptive behaviours was dependent upon the level of perceived performance climate. In a highly performance-oriented climate, awkward children who had high perceptions of competence displayed more adaptive behaviours and fewer maladaptive behaviours than awkward children with low perceptions of competence. In contrast, adaptive and maladaptive behaviours were not related to perceived competence in low performance-oriented climates.

In the introduction to this paper, I asked the question, "what enables some physically awkward children to exhibit adaptive participation patterns similar to those of their nonawkward peers?" The findings of this study help to answer this question by confirming the importance of perceived competence as the central mediating construct of achievement behaviour (Nicholls, 1989; Nicholls et al., 1989; Roberts, 1992). Perceptions of competence were found to be positively related to awkward children's engagement with adaptive behaviours, and negatively related to their use of maladaptive behaviours relative to other awkward children. Even more interesting, however, were the results of the individual-level analyses indicating that many awkward children with high perceptions of competence engaged in more adaptive behaviours, and most engaged in fewer maladaptive behaviours, than nonawkward children observed during the same class.

How can parents, teachers, and physical activity professionals possibly hope to assist with the development and maintenance of adaptive participation patterns in physically awkward children? The strategy recommended by achievement goal theorists (see Nicholls et al., 1989), and supported by the results presented in Chapter 3, is to

construct physical activity settings so that they emphasize task-oriented goals and minimize ego-oriented goals. In fact, examination of the plots of the significant interactions (as seen in Figure 4-1 and Figure 4-2) suggests that awkward children who are most "at-risk" in terms of the maladaptive behavioural patterns (i.e., low levels of adaptive behaviours and/of high levels of maladaptive behaviours) associated with the syndrome of physical awkwardness are those children who do not perceive themselves to be highly competent (presumably) in comparison to others, and who perceive the motivational climates of their physical education classes to be moderately-to-highly performance-oriented. The next logical step for researchers and practitioners is to implement teaching strategies that emphasize appropriate motivational climates in physical education, and then examine the efficacy of these programs with respect to the benefits they provide for physically awkward children who have low perceived competence.

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CHAPTER 5

GENERAL DISCUSSION AND CONCLUSION

In general, the findings of the three studies comprising this dissertation indicate that the negative self-perceptions and maladaptive behaviour patterns described in the syndrome of physical awkwardness (Wall, 1982; Wall, Reid & Paton, 1990) are not inevitable for all children who are physically awkward. Moreover, the results imply that parents, teachers, and coaches can have a significant influence upon the development of awkward children's self-perceptions and participation behaviours, through the important roles that these individuals play in structuring the motivational climates of physical activity situations.

More specifically, the results of the study presented in Chapter 2 revealed that physically awkward children did not necessarily report low self-concepts of ability in physical education, despite their movement difficulties and the presence of their movement-competent peers. Results from Chapters 3 and 4 indicated that awkward children who were predisposed toward task orientation had a tendency to perceive the motivational climates of their physical education classes to be highly mastery-oriented and, in turn, to have higher perceptions of competence. Moreover, results also showed that awkward children with high perceptions of competence engaged in (1) more adaptive behaviours during physical education, and (2) fewer maladaptive behaviours in physical education, than physically awkward children with low perceptions of competence. Therefore, as predicted by achievement goal theory, physically awkward children who adopted the task-involved motivational pattern described above were less likely to develop the negative behaviour patterns outlined in the syndrome of physical awkwardness. In contrast, awkward children who were highly ego oriented tended to

perceive the motivational climates of their physical education classes to be highly performance-oriented. Perceptions of a performance climate were associated with perceptions of low ability. Low perceptions of ability were associated with an increasing frequency of maladaptive behaviours and a decreasing frequency of adaptive behaviours in physical education, particularly when the motivational climate was perceived as being highly performance-oriented. In other words, awkward children who adopted an ego-involved motivational pattern tended to engage in behaviours that were counter-productive to long term skill development.

Unfortunately, the correlational design of the studies in this dissertation preclude a causal interpretation of the relationships among the motivational and behavioural variables. Therefore, as indicated in Chapter 4, the next logical step is to develop an intervention program for physically awkward children who exhibit maladaptive behavioural patterns in physical education, that is designed to simultaneously decrease their use of maladaptive behaviours and increase their use of adaptive behaviours. Nicholls, Cheung, Laurer and Patashnick (1989) argue that prevention- and intervention-strategies should focus on the situational and personal characteristics that increase children's levels of task involvement to "...enable even those students who recognize that they are at the bottom of the heap in terms of ability to be favorably motivated and find [participation and] learning meaningful" (p. 68). To this end, Ames (1992) has developed a series of classroom interventions targeting the motivational climate which are designed to increase children's perceptions of a mastery climate and their levels of task-involvement. Researchers have also recommended that the intervention program developed by Ames (1992) be adopted for use in physical education (Treasure & Roberts, 1995).

Finally, an interesting issue regarding achievement behaviours in physical education emerged from the three studies in the dissertation, and should potentially be considered in the design of future research. During the observation of physical education classes it became apparent that the nature of the tasks or activities that were assigned by the teachers may have had an important influence upon the frequency of adaptive and maladaptive behaviours observed. Specifically, the activities observed during the physical education classes varied in the extent to which a child's failure was "public" in terms of how noticeable the failure was to fellow classmates. For example, in certain activities (e.g., high jump or long jump practice; batting or fielding in a baseball game) the task was only performed by one child at a time while fellow classmates looked on; this type of situation made the child's performance (i.e., success or failure) acutely apparent to every other child in the environment. In all likelihood, this enhanced degree of "social spotlight" may have accentuated the threat of public failure and the negative social consequences associated with this failure. Therefore, children who anticipated failure in these conditions may have been more motivated to adopt maladaptive behaviours than in situations where their performance failures were less noticeable (i.e., performance during a game where all participants were simultaneously engaged in their own tasks). In conclusion, physical educators should give careful consideration to the types of activities included in their physical education classes, or at least to the organizational structure of their lessons, in order to minimize the perception of threat associated with failure.

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APPENDICES

Appendix A

The Modified TEOSQ

Directions: Please read each of the statements listed below and indicate how much you personally agree with each statement by circling the appropriate response.

When do you feel most successful in gym class? In other words, when do you feel a gym class has gone really good for you?

I feel most successful in gym class when...	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I'm the only one who can do the play or skill.	SD	D	N	A	SA
I learn a new skill and it makes me want to practice more.	SD	D	N	A	SA
I can do better than my friends.	SD	D	N	A	SA
The others can't do as well as me.	SD	D	N	A	SA
I learn something that is fun to do.	SD	D	N	A	SA
Others mess-up and I don't.	SD	D	N	A	SA
I learn a new skill by trying hard.	SD	D	N	A	SA
I work really hard.	SD	D	N	A	SA
I score the most points/goals/hits/etc.	SD	D	N	A	SA
Something I learn makes me want to go and practice more.	SD	D	N	A	SA
I'm the best.	SD	D	N	A	SA
A skill I learn really feels right.	SD	D	N	A	SA
I do my very best.	SD	D	N	A	SA

Appendix B

The Modified PMCSQ

Directions: Please read each of the statements listed below and indicate how much you personally agree with each statement by circling the appropriate response.

In this gym class...	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Kids feel good when they do better than other classmates.	SD	D	N	A	SA
Kids are punished for mistakes.	SD	D	N	A	SA
Trying hard is rewarded.	SD	D	N	A	SA
Kids get criticized for mistakes.	SD	D	N	A	SA
The teacher focuses on skill improvement.	SD	D	N	A	SA
Doing better than other students is important.	SD	D	N	A	SA
Each student's improvement is important.	SD	D	N	A	SA
Teacher pays most attention to the "best athletes".	SD	D	N	A	SA
Doing better than others is important.	SD	D	N	A	SA
The teacher favors some kids.	SD	D	N	A	SA
Students try hard to learn new skills.	SD	D	N	A	SA
Kids are encouraged to try to do better than other students.	SD	D	N	A	SA
Everyone wishes they were the star athlete.	SD	D	N	A	SA
The teacher want us to try new skills.	SD	D	N	A	SA
Only the best kids "get noticed".	SD	D	N	A	SA
Kids like playing with and competing against good athletes.	SD	D	N	A	SA
Kids are afraid to make mistakes.	SD	D	N	A	SA
All kids in this class have an important role.	SD	D	N	A	SA
Everyone get to try every position in every activity.	SD	D	N	A	SA
Only a few kids can be the "stars".	SD	D	N	A	SA
Students are encouraged to work on their weaknesses.	SD	D	N	A	SA

Appendix C

Path Analysis of Factors Affecting Perceived Competence

The causal model shown in Figure C-1 illustrates the hypothesized effects of individual differences in goal orientations and perceptions of the motivational climate on perceived competence, that were tested using path analysis.

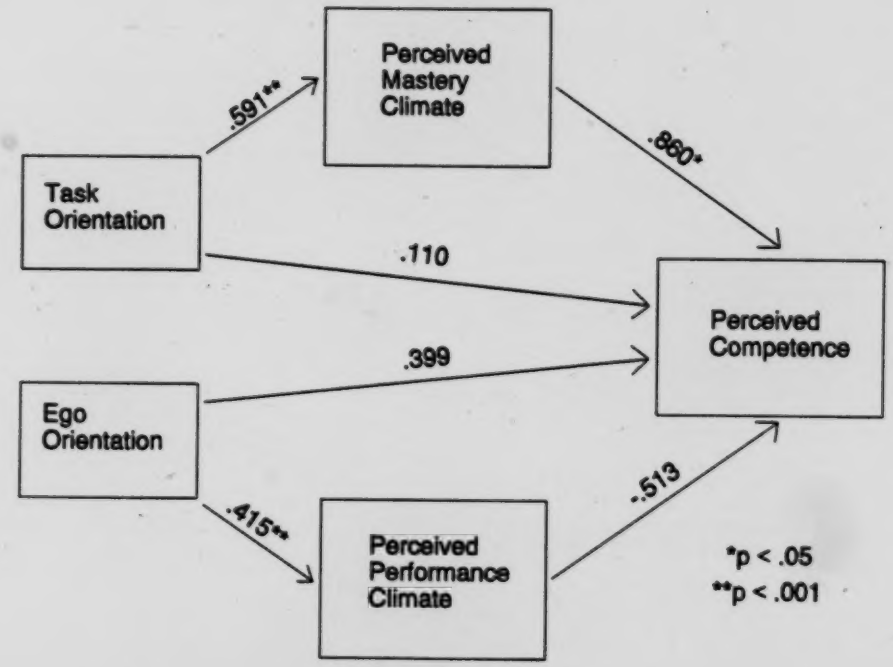

Figure C-1. Path model of the effects of goal orientation and perceived motivational climate on perceptions of competence.

In order to calculate the path coefficients for the causal model, three regression analyses were necessary. First, two simple regression analyses were conducted with perceived mastery climate regressed on task orientation, and perceived performance

climate regressed on ego orientation. Next, a multiple regression analysis was undertaken, with perceived competence regressed on task orientation, ego orientation, perceived mastery climate, and perceived performance climate.

Table C-1 contains the direct and indirect effects, and the decomposition of Pearson correlations between elements of the path model. As indicated in the table, significant positive effects were obtained for the direct effects of (1) task orientation on perceived mastery climate, (2) ego orientation on perceived performance climate, and (3) perceived mastery climate on perceived competence. The direct effects of perceived performance climate and ego orientation on perceived competence approached significance (p = .07 and p = .08, respectively).

Table C-1

Decomposition of Pearson Correlations Between Elements of Path Model

		Causal			
Relationship	Total r	Direct	Indirect	Total	Spurious
Task Orientation to Perceived Mastery Climate	.55	.55	none	.55**	none
Task Orientation to Perceived Competence	.17	.04	.17	.21	none
Perceived Mastery Climate to Perceived Competence	.33	.31	none	.31*	.02
Ego Orientation to Perceived Performance Climate	.54	.54	none	.54**	none
Ego Orientation to Perceived Competence	.14	.26	-.14	.12	none
Perceived Performance Climate to Perceived Competence	-.12	-.26	none	-.26	.14

*$p < .05$. ** $p < .001$.

Appendix D

ALT-PE Behavior Categories

CONTEXT

GENERAL (Not related to motor goals)	SUBJECT MATTER KNOWLEDGE (Transmit knowledge related to motor goals)	SUBJECT MATTER MOTOR (Involvement in motor skills)
Transition - T (Organizing for activity)	Technique - TN (Physical form of a skill)	Skill Practice - P (Practice of skills not in applied context)
Management - M (Business not related to motor goals e.g. attendance, discipline)	Strategy - ST (Plans for action, performing)	Scrimmage or Routine - S (Refinement and extension of skills in simulated context with teacher feedback)
Break - B (Rest, Water, washroom)	Rules - R (Regulations for activity)	Fitness - F (Activity of sufficient intensity, frequency duration)
Warm Up - WU (Exercises to prepare for activity e.g. laps)	Social Behaviour - SB (Behavior appropriate for activity e.g. sportsmanship)	Game - G (Skills used in applied context with little intervention)
	Background - BK (History, heros...for activity)	Warm Up Practice - WP (Skill practice plus exercise)

LEARNER INVOLVEMENT

NOT MOTOR ENGAGED (Involvement not directly leading to motor skill performance)	MOTOR ENGAGED (Involvement leading to motor skill performance)
Interim - I (Interruption of ongoing task)	Motor Appropriate (Success) - MA (Engaged in assigned motor activity with high degree of success)
Waiting - W (For a turn or instruction)	Motor Inappropriate (Too easy/hard) - MI (Engaged in assigned motor activity that is too difficult/easy))
Off Task - OF (Not doing assigned task, deviant)	Motor Support (Assisting) - MS (Assisting others in motor skills e.g. spotting, feeding ball)
On Task - ON (Getting ready for assigned task)	Motor Off Task - MO (Engaged in related motor activity but not the task assigned)
Cognitive - C (Listen to instructor or watch a demo)	